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Separate paging is given to this Part in order that it may be filed
as a separate compilation

NOTICE

The undermentioned Gazettes of India Extraordinary were published upto the 4th January 1965:—

Issue No.	No. and Date	Issued by	Subject
206	G.S.R. 1851, dated December, 1964.	30th Ministry of Food and Agriculture.	Further amendment o G.S. R. 1237, dated 20th July, 1963.
	G.S.R. 1852, dated December, 1964.	30th Do.	Further amendment to G.S. R. 1987, dated 30th December, 1963.
207	G.S.R. 1853, dated December, 1964.	30th Ministry of Finance.	Amendment to Notification No. 140, dated 31st December, 1960.
	G.S.R. 1854, dated December, 1964	30th Do.]	Amendment to Notification No. 173, Customs, dated 24th November, 1962.
	G.S.R. 1855, dated December, 1964.	30th Do.	Amendment to Notification No. 88-Customs, dated 7th July, 1962.
	G.S.R. 1856, dated December, 1964	30th Do.	Amendment to Notification No. 168-Customs, dated 22nd June, 1963.
	G.S.R. 1857, dated December, 1964	30th Do.	Amendment to Notification No. G.S.R. 1118, dated 1st July, 1963.
208	G.S.R. 1858, dated December, 1964	31st Ministry of Food and Agriculture.	Amendment to Notification No. G.S.R. 1588, dated 30th October, 1964.
209	G.S.R. 1859, dated December, 1964.	31st Do.	Amendment to Notification No. G.S.R. 1634, dated 12th November, 1964.
210	G.S.R. 1860, dated December, 1964.	31st Do.	The Roller Mills Wheat products (Price Control) Order, 1965.

Issue No.	No. and date	Issued by	Subject
1	G.S.R. 33, dated 1st January, 1965.	Ministry of Finance.	Amendment to Notification No. 248-Customs, dated 27th September, 1958.
	G.S.R. 34, dated 1st January, 1965.	Do.	Amendment to Notification No. 229-Customs, dated 13th November, 1963.
	G.S.R. 35, dated 1st January, 1965.	Do.	Exempting goods mentioned therein from certain duty of Customs.
	G.S.R. 36, dated 1st January, 1965.	Do.	Exempting goods mentioned therein from certain duty of Customs.
2	G.S.R. 37, dated 2nd January, 1965.	Do.	Appointment of persons in the board of directors of the Food Corporation of India.
3	G.S.R. 38, dated 2nd January, 1965.	Ministry of Food and Agriculture	Directing that powers in relation to stocks of food-stuffs, shall also be exercisable by officers mentioned therein.
	G.S.R. 39, dated 2nd January, 1965.	Do.	The Delhi Roller Mills Wheat Products (Retail Price Control) Order, 1965.
4	G.S.R. 40, dated 4th January, 1965.	Do.	Amendment to G.S.R. 1634, dated 12th November, 1964.

Copies of the Gazettes Extraordinary mentioned above will be supplied on indent to the Manager of Publications, Civil Lines, Delhi. Indents should be submitted so as to reach the Manager within ten days of the date of issue of these Gazettes.

PART II—Section 3—Sub-section (i)

General Statutory Rules (including orders, bye-laws etc. of a general character) issued by the Ministries of the Government of India (other than the Ministry of Defence) and by Central Authorities (other than the Administrations of Union Territories).

SUPREME COURT OF INDIA

New Delhi, the 6th January 1965

G.S.R. 94.—The following is published for general information.

Amendment to Supreme Court Rules, 1950

The Supreme Court of India, in exercise of its rule-making powers and with the approval of the President, hereby makes, with immediate effect, the following

amendments to the Supreme Court Rules, 1950, namely:—

The following form be added as Form No. 28, in the Fifth Schedule:

No. 28

(Form of Bank Guarantee)

In the matter of

CIVIL APPEAL/PETITION/C.M.P. (here give the number of Cause/matter/appeal.

And

In the matter of

.....(Give the name of the parties)

Whereas.....(Here give the name of the party obtaining the order)(above-named has filed an Appeal in the Supreme Court against the Judgment and decree/order of the (here describe the Court and the number of the cause).....

And whereas on a motion made for the purpose on the.....(here give the date) the Supreme Court of India in the aforesaid proceedings been pleased to order *inter alia* as follows:

(Here quote the relevant terms of the order).....

And whereas (here give the name of the party concerned).....the respondent (or appellant, as the case may be).....has requested us,..... (here give the name of the Bank) having its registered office at (here give the registered address of the place of business of the Bank) to guarantee the due payment of the said sum of Rs.....(here give the amount) by the said(here give the name of the party) in the event of the Supreme Court allowing/modifying/dismissing the said appeal and setting aside the decree or such other lesser amount as the Court may order. We.....(here give the name of the Bank) are hereby held and firmly bound unto the Supreme Court of India through the Registrar of the said Court for the payment to it or to the(here give the name of the party concerned).....on demand and without demur of the said sum.....(here give the amount) or such other lesser amount as may be ordered by the Supreme Court and require to be paid or refunded by the.....(here give the name of the party concerned) to the(here give the name of the party to whom the amount is to be paid) as a result of the final disposal of the said.....(here indicate the appeal, cause or matter) and the guarantee herein contained shall not be affected by any change in the constitution of the Bank and it is HEREBY agreed by and between the parties that this guarantee shall remain in full force and virtue till the disposal of the.....(here give the number of the case, appeal, cause or matter) to which the aforesaid order of the Court relates and until an order of the Supreme Court is made discharging this guarantee.

IN WITNESS WHEREOF we the.....(here give the name of the Bank) has executed this,

This the.....day of.....19...

Signed

for the.....(here give the name of the Agent of the Bank).

Witness :

[No. F.8/64-SCMJ-II.]

By Order of the Court.

Y. D. DESAI, Registrar.

MINISTRY OF LAW**(Department of Legal Affairs)***New Delhi, the 7th January 1965*

G.S.R. 95.—(Contract/Amendment 63) In exercise of the powers conferred by clause (1) of article 299 of the Constitution, the President hereby makes the following further amendment in the notification of the Government of India in the Ministry of Law No. G.S.R. 1161 dated 1st December, 1958 relating to the execution of contracts and assurances of property, namely :—

In the said notification:—

In Part VII which relates to the Ministry of Food and Agriculture, under Head B—Department of Food—in item 1 after clause (c), the following clause shall be inserted, namely :—

“(d) All contracts and instruments relating to the grant of loans to an owner of a rice mill holding a valid licence under the Rice-Milling Industry (Regulation) Act, 1958 (21 of 1958) in the various States”.

[No. F.17(1)/61-J.]

G. K. PURANIK,

Dy. Legal Adviser to the Govt. of India.

MINISTRY OF HOME AFFAIRS**CORRIGENDUM***New Delhi, the 8th January 1965*

G.S.R. 96.—In the notification of the Government of India in the Ministry of Home Affairs No. G.S.R. 1745 dated the 3rd December, 1964, published at page 1910 of the Gazette of India, Part II, Section 3, sub-section (1), dated the 12th December, 1964,—

In lines 3 and 4,

For “Special Branch”.

Read “Special Branch (I)”.

[No. F.1/75/64-F.III.]

FATEH SINGH, Joint Secy.

MINISTRY OF FINANCE**(Department of Company Affairs and Insurance)***New Delhi, the 2nd January 1965*

The Companies (Central Government's) General Rules & Forms

G.S.R. 97.—In exercise of the powers conferred by clauses (a) and (b) of sub-section (1) of section 642 of the Companies Act, 1956 (1 of 1956), the Central Government hereby makes the following rules further to amend the Companies (Central Government's) General Rules and Forms, 1956, namely :—

1. These rules may be called the Companies (Central Government's) General Rules and Forms (Amendment) Rules, 1965.

2. In rule 18 of the Companies (Central Government's) General Rules and Forms, 1956 (hereinafter referred to as the said rules), in sub-rule (1), for the words “within two months from the date on which the alteration was made or occurred”, the words, figures and letters “on or before the 31st January of the year following the year in which the alteration was made or occurred” shall be substituted.

3. In Annexure A to the said rules,—

(1) for the existing Form No. 8, the following Form shall be substituted, namely :—

"No. of Company
Nominal Capital Rs.

Form No. 8

THE COMPANIES ACT, 1956

Particulars of charge (a) created by a company registered in India
subject to which property has been acquired by a
company registered in India

Pursuant to section 125
127

Limited/Private Limited,

Presented by

Particulars of Charge (a) created
subject to which property has been acquired

Limited/Private Limited,

a company registered in India.

Date and description of the instrument creating or evidencing the charge (a)	Amount secured by the charge/Amount owing on security of the charge	Short particulars of the property charge. If the Property acquired is subject to charge, date of acquisition of the property should also be given
--	---	---

(1)

(2)

(3)

Gist of the terms and conditions and extent and operation of the charge	Names, addresses and description of the persons entitled to the charge (b).	Amount of rate per cent of the commission, allowance or discount (if any) paid or made either directly or indirectly by the company to any person in consideration of his subscribing or agreeing to subscribe, whether absolutely or conditionally, or procuring or agreeing to procure subscriptions, whether absolute or conditional, for any of the debentures included in this return(c). "
---	---	--

(4)

(5)

(6)

Signature

Designation of position in relation to the Company.

79

Dated the

day of

(a) "Charge" includes mortgage—See section 124. A description of the instrument, that is to say, whether a trust deed, mortgage or debenture, should also be given.

(b) "Persons entitled to the charge" will include mortgagees.

(c) The rate of interest payable under the terms of the debentures need not be entered.†;

(ii) the existing Form No. 9 shall be *omitted*;

(iii) after Form No. 21, the following Form shall be *inserted*, namely :—

"Company No.....

Form No. 21A

THE COMPANIES ACT, 1956

(Pursuant to section 160)

1. Name of the Company.....
2. Presented for filing by.....
3. Annual Return of the company made up to the.....day of.....
19.....being the date of *the last Annual General Meeting of the company.*†
4. Address of the Registered Office of the Company.....
5. List of *past and present members.

[NOTE.—The Companies holding a licence under section 25 of the Companies Act, 1956 exempting them from using the word "Limited" as the last word of their names, do not have to fill in this item as they are exempt from this under Order No. S.O. 1578 dated 1st July, 1961 of the former Department of Company Law Administration and published in the Gazette of India 1961, section 3(ii)—Part II—Page 1547].

Folio in Register of Members	Names, addresses and occupa- tion, if any	Name of father or husband	Date on which they become members	Date on which they ceased to be members	Remarks, if any
(1)	(2)	(3)	(4)	(5)	(6)

*NOTE: (1) Names of persons who ceased to be the members since the date of the last annual general meeting or of the latest due date thereof and the respective dates on which they so ceased, are also to be given.

(2) If the names in the list are not arranged in alphabetical order, an index sufficient to enable the name of any person to be readily found must be annexed.

†See the Explanation to sub-section (1) of section 159 of the Act. Where the annual general meeting for a year has not been held, the return should be made up to the latest date on or before which that meeting should have been held in accordance with the provisions of section 160 of the Act.

6. Particulars of Directors, Managing Director, Managing Agents, Secretaries and Treasurers, Manager and Secretary (a) :

(A) Particulars of persons who are *Directors, Managing Director* of the company on the day of the last annual general meeting or the latest due date thereof viz. the.....day of.....19.....

Present name(s) and surname(s) in full and Whether direct or managing director	Any former name(s) or surname (s) in full	Father's/ Husband's name and surname	Nationality and Nationality of origin, if different from present nationality	Usual residential address
(1)	(2)	(3)	(4)	(5)

Business occupation and particulars of directorships, managing directorships, managing agencies, managerships and secretaryships held in other companies/bodies corporate	Date of birth and age (b)	Date of appointment	Date of cessation, if any
(6)	(7)	(8)	(9)

NOTE : (a) The expression "managing director", "director" etc. includes a member of managing/executive committee.

(b) The information under column (7) need not be given in respect of private companies which are not subsidiaries of public companies.

(B) Particulars of the person/persons who is/are *managing agent/secretaries and treasurers* of the company on the day of the latest annual general meeting or the latest due date thereof viz. the.....day of.....19.....

Where the managing agent is an individual, present name(s) and surname(s) in full. Where the managing agent is or secretaries and treasurers are a firm, the firm's name(*). Where the managing agent is or secretaries and treasurers are a body corporate, the corporate name(**)	Any former name(s) and surname(s) in full	Father's/ Husband's name and surname	Nationality and Nationality of origin, if different from present nationality
(1)	(2)	(3)	(4)

Usual residential address, if a firm or body corporate, the address of registered or principal office	Particulars of managing agencies, offices of secretaries and treasurers, directorships, managerships and secretaryships held in other companies/bodies corporate	Date of appointment	Date of cessation, if any
(5)	(6)	(7)	(8)

NOTES : (*) In the case of a firm, the full name, address and nationality of each partner and the date on which each became a partner should be indicated.

(**) In the case of a body corporate, its corporate name and registered or principal office should be given along with the full name, address and nationality of each of its directors.

(C) Particulars of the person(s) who is *Manager/Secretary* of the company on the day of the latest annual general meeting, or the latest due date thereof, namely, the.....day of.....19.....

Present name(s) or surname(s) in full and whether Manager/Secretary	Any former name(s) and surname(s) in full	Father's/Husband's name and surname	Nationality and nationality of origin, if different from present nationality
(1)	(2)	(3)	(4)
<hr/>			
Usual residential address.	Business occupation and particulars of directorships, managing directorships offices of secretaries and treasurers, managementships and secretaryships held in other companies/bodies corporate	Date of appointment	Date of cessation, if any
(5)	(6)	(7)	(8)

7. Particulars of Indebtedness.

A statement is annexed to this return duly signed by the signatories to this return and containing particulars of the total amount of indebtedness as on the day of the aforesaid annual general meeting in respect of all charges which are or were required under the Companies Act, 1956, or under any previous company law, or which would have been required to be registered under the aforesaid Act if they had been created after the commencement of the said Act.

Certificates to be given by a director and the managing agent/secretaries and treasurers, Manager/Secretary or by two directors one of whom shall be managing director where there is one.

We certify that the return states the facts as they stood on the date of the annual general meeting aforesaid, correctly and completely.

We certify that since the date of the last annual return the transfer of all debentures and the issue of all further certificates of debentures have been appropriately recorded in the books maintained for the purpose.

[In case of private companies only]

We certify that the company has not since the date of the annual general meeting with reference to which the last return was submitted or in the case of first return, since the date of the incorporation of the company, issued any invitation to the public to subscribe for any debentures of the company.

We certify that the excess of the number of members of the company over fifty consists wholly of persons, who under sub-clause (b) of clause (iii) of section 3 of the Companies Act, 1956, are not to be included in reckoning the number of fifty.

Place :
Date :

Signed.....Director
Signed.... Director/Managing
Agent/Secretaries
and Treasurers/
Manager/Secretary"

(iv) for the existing Form No. 29, the following Form shall be *substituted*, namely :—

"No. of Company—

Form No. 29

THE COMPANIES ACT, 1956

Consent to act as director of a company and/or undertaking to take and pay for qualification shares.

Pursuant to section 264(2)/266(1) (a)/266(1) (a)

and 266(1) (b) (iii)

Name of Company.....Limited

Presented by.....

To the Registrar of Companies,

I, the undersigned, having consented to act as director of the company.....
.....Limited, pursuant to section 264(2)/266(1) (a) of the Companies Act, 1956 and certify that I have not been disqualified to act as a director under section 267 and/or 274 of the Companies Act, 1956.

I, the undersigned, having consented to act as director of the company.....
.....Limited, also hereby undertake to take from the said company and pay for.....shares of Rs.....each, being the number/value of the shares prescribed as the qualification shares for the office of director of the said company.

Name and surname in full and father's name	Address	Occupation	Date of birth	Nationality	Signature
(1)	(2)	(3)	(4)	(5)	(6)

Dated the.....day of.....19.....

NOTE : (1) Delete the portion not applicable.

(2) If a director signs through his agent authorised in writing, the authority must be produced before the Registrar.

(3) In case of undertaking to take and pay for qualification shares, the form should be accompanied by the necessary stamp duty.”;

(v) the existing Form No. 31 shall be *omitted*;

(vi) in Form No. 44 under the heading “Director—Individual”, for the existing heading in column (5), the following heading shall be *substituted*, namely :—

“Business occupation, or, if there is no business occupation, particulars of some one of other directorships held, if any”;

(vii) for the existing Form No. 49, the following Form shall be substituted, namely :—

"No. of Company F.

Form No. 49

THE COMPANIES ACT, 1956

Return of alteration in the (A) Charter, Statutes or Memorandum and Articles of Association (B) address of the Registered or Principal office and (C) List or Particulars of the Directors and Secretary of a foreign company.

Pursuant to section 593(a)/(b)/(c)

Name of Company :

Country of Incorporation :

Presented by:

To the Registrar of Companies,, a foreign company having established a place of business in India at.....hereby gives you notice and delivers the under-mentioned Return of alteration in the—

(A) *Charter, Statute, Memorandum or Articles of Association or other instrument constituting or defining the constitution of the company.*

A brief description of the alteration is given hereunder:—

“At an Extra-ordinary/General Meeting of the shareholders of the company held at.....on.....day of.....19.....ordinary/special resolution was passed authorising.....(Certified copy of the resolution and/or the copy of the amended document should be enclosed. If the resolution or document is not in the English language, a certified translation thereof must accompany this return).”

(B) *Registered or Principal office of the company.*

The registered/principal office of the company in the country of incorporation has shifted from.....to.....with effect from.....

(C) (i) List or particulars of the Directors/Secretary of the company (individuals)

Present name and surname in full	Usual residential address	Nationality	Business occupation or if there is no business occupation, particulars of some one of other directorships held, if any	Remarks as to alteration
(1)	(2)	(3)	(4)	(5)

(ii) List or particulars of the directors/secretary of the company * (bodies corporate)

Corporate name	Registered or principal office of body corporate	**Names of directors of body corporate		Remarks as to alteration.
		A Full name and address	B Nationality of each director and nationality of origin if different from present nationality	
(1)	(2)	(3)	(4)	(5)

(* The following particulars should be furnished where the secretary is a firm—

- (i) Name of the firm;
- (ii) registered or principal office;
- (iii) remarks as to alteration.)

[** Columns 3 and 4 need be completed only in case of directors (bodies corporate)]

Signature or Designation of any one or more persons authorised under Section 592 (1) (d) of the Companies Act, 1956, or of some other person in India duly authorised by the company. }

Dated the.....day.....19.....

NOTE : (1) Portion not relevant should be deleted.

(2) Nature of alteration should be precisely stated, along with the date of alteration.”;

(viii) the existing Forms Nos. 50 and 51 shall be *omitted*.

(ix) for the existing Form No. 52, the following Form shall be substituted, namely :—

“No. of Company F.

Form No. 52

THE COMPANIES ACT, 1956

Return of alteration in the (A) Names or addresses of Persons resident in India, authorised to accept service on behalf of a foreign company (B) Address of Principal place of business in India of a foreign company.

Pursuant to section 593(d)/(e)

Name of Company :

Country of Incorporation :

Presented by :

To the Registrar of Companies,, a foreign company, having established a place of business in India at.....hereby gives you notice and deliver the return of alteration in the

(A) Names or addresses of persons resident in India authorised to accept service on behalf of the company.

Present name and surname in full.	Usual residential address.	Remarks as alteration.
(1)	(2)	(3)

(B) Address of Principal place of business of the company in India

The office of principal place of business in India has shifted from.....towith effect from.....

NOTE : (1) Portion not relevant should be deleted.

(2) Date of alteration should be stated.”;

(x) the existing Form No. 53 shall be *omitted*; and

(xi) after Form No. 54, the following Form shall be inserted, namely :—

“No. of Company F.

Form No. 54A

THE COMPANIES ACT, 1956

Notice by a foreign company on creating to have place of business in India.

[Pursuant to section 597(3)]

Name of the Company :

Where incorporated :

Presented by :

The....., which had its principal place of business.... hereby gives notice in pursuance of section 597(3) of the Companies Act, 1956 that it ceased to have a place of business in India at the said place since.....

2. The company is also not maintaining a place of business at any other place in India.

Signature or signatures of any one or more persons authorised under section 592(1)(d) of the Companies Act, 1956, or of some other persons in India duly authorised by the company.

Dated this.....1964.”

[No. F. 5/2/64-PR.]

N. PARASURAMAN, Under Secy.

(Department of Company Affairs and Insurance)

New Delhi, the 4th January 1965

G.S.R. 98.—Whereas the Central Government has had under consideration the question of deciding the future of the managing agency system in India, particularly in view of the fact that the terms of office of a large number of managing agents are due to expire by August 1965; and,

Whereas it has been suggested to the Government of India that the continuance of the managing agency system in the established industries should be specifically considered.

Now, therefore, in exercise of the powers conferred by Rule 11 of the Companies (Central Government's) General Rules & Forms, 1956 and of all other powers enabling it in this behalf, the Central Government hereby appoints a Committee of Inquiry consisting of the following:—

Chairman

1. Dr. I. G. Patel,
Chief Economic Adviser to the Government of India.

Members

2. Shri K. L. Ghei,
Additional Secretary,
Ministry of Finance.
3. Shri B. N. Adarkar,
Additional Secretary,
Ministry of Finance.
4. Shri K. B. Rao,
Officer on Special Duty,
Ministry of Industry & Supply.
5. Shri S. Vohra,
Joint Secy. to the Govt. of India,
Ministry of Commerce.

Shri Faqir Chand, Deputy Secretary to the Govt. of India, Deptt. of Company Affairs & Insurance, is hereby appointed Secretary of the Committee.

The Committee shall enquire into and report on, and in respect of, the desirability of applying the provisions of sub-section (2) of section 324 of the Companies Act, 1956 (1 of 1956) to companies engaged in established industries or any other industry or business as may be deemed fit by the Committee in this behalf.

[No. GSR. 12(57)-C.III/63.]

R. C. DUTTA, Secy.

(Department of Revenue)**CENTRAL EXCISES***New Delhi, the 16th January 1965*

G.S.R. 99.—In exercise of the powers conferred by rule 12-A of the Central Excise Rules, 1944, the Central Government hereby makes the following further amendment in the notification of the Government of India in the Ministry of Finance (Department of Revenue) No. 62/58-Central Excises, dated the 21st June, 1958, namely:—

In the Table annexed to the said notification, after Serial No. 9 and the entries relating thereto, the following shall be inserted, namely:—

S. No.	Excisable materials used	Description of goods	Rate of rebate
1	2	3	4
"10	Aluminium	(a) Aluminium utensils manufactured exclusively from goods falling under Item No. 27(b) of the First Schedule to the Central Excise and Salt Act, 1944 (1 of 1944.)	Rs. 600/- per metric tonne of utensils exported.
		(b) Other utensils made wholly of aluminium.	Rs. 360/- per metric tonne of utensils exported."

[No. 4/65-C.E/F. No. 17/4/64-CX.III.]

N. B. SANJANA, Under Secy.

(Department of Revenue)**CENTRAL EXCISES***New Delhi, the 16th January 1965*

G.S.R. 100.—In exercise of the powers conferred by sub-section (2) of section 3 of the Central Excises and Salt Act, 1944 (1 of 1944) and in supersession of the notification of the Government of India in the Ministry of Finance (Department of Revenue) No. 99/62-Central Excises dated the 25th May, 1962, the Central Government hereby fixes the tariff value for carbonic acid (carbon dioxide) at Rs. 1150.00 per metric tonne.

[No. 5/65.]

N. MOOKHERJEE, Dy. Secy.

(Department of Revenue)**CENTRAL EXCISES***New Delhi, the 16th January 1965*

G.S.R. 101.—In exercise of the powers conferred by sub-rule (1) of rule 8 of the Central Excise Rules, 1944, read with sub-section (3) of section 3 of the Additional Duties of Excise (Goods of Special Importance) Act, 1957 (58 of 1957), the Central Government, being satisfied, that the flood in the State of Punjab in the year 1964 was a major natural calamity, hereby exempts all goods donated till the 31st day of March, 1965 for flood relief in that State from the whole of the excise duty and the additional duty of excise leviable thereon:

Provided that—

- (a) it is certified by the manufacturer or producer of such goods on the relevant clearance documents that the goods are intended to be

donated to any of the following officers of the Government of the State of Punjab for flood relief work in that State, namely:—

- (i) Deputy Commissioners of Districts;
 - (ii) Commissioners of Divisions;
 - (iii) Financial Commissioners; and
- (b) the goods are sent direct from the factory or by the producer to any such officer.

2. This notification shall be deemed to have come into force on the 16th day of December, 1964.

[No. 3/65-C.E. F. No. 5/6/64-CX.I.]

E. R. SRIKANTIA, Under Secy.

(Department of Revenue)

CUSTOMS

New Delhi, the 16th January 1965

G.S.R. 102.—In exercise of the powers conferred by sub-section (1) of section 25 of the Customs Act, 1962 (52 of 1962), the Central Government, being satisfied that it is necessary in the public interest so to do, hereby exempts the goods specified in paragraph 2 when imported for the purpose of search, rescue, investigation, repairs, or salvage of a damaged aircraft, subject to the condition that such goods are exported not later than a period of three months from the date of importation thereof or such extended period as may be specified by the Collector of Customs concerned.

2. The goods referred to in paragraph 1 are:—

- (i) aircraft;
- (ii) tools;
- (iii) spare parts;
- (iv) any other equipment necessary for the aforesaid purpose.

[No. 10/F. No. 5/11/64-Cus.VII.]

G. P. DURAIRAJ, Dy. Secy.

(Department of Revenue)

CUSTOMS

New Delhi, the 16th January 1965

G.S.R. 103.—In exercise of the powers conferred by sub-section (1) of section 25, read with sub-section (3) of section 160, of the Customs Act, 1962 (52 of 1962) the Central Government, being satisfied that it is necessary in the public interest so to do, hereby rescinds the notification of the Government of India in the Ministry of Finance (Department of Revenue) No. 51-Customs dated the 15th February, 1958.

[No. 11/F. No. 5/73/62-Cus.I.]

M. PANCHAPPA, Dy. Secy.

COLLECTORATE OF CUSTOMS & CENTRAL EXCISE, COCHIN I

Cochin, the 29th December 1964

G.S.R. 104.—In exercise of the powers conferred on me by Rule 5 of the Central Excise Rules, 1944, I hereby empower all Officers not below the rank of an Assistant Collector of Central Excise, to exercise within their respective

jurisdiction the powers of a Collector under Sub-rule (2) of Rule 56-A of Central Excise Rules, 1944.

[No. 3/64 Cx.]

M. RAMACHANDRAN, Collector.

MINISTRY OF COMMERCE

New Delhi, the 31st December 1964

G.S.R. 105.—In exercise of the powers conferred by the proviso to Article 309 of the Constitution, the President hereby makes the following rules further to amend the Import and Export Trade Control Organisation (Class I and Class II Posts) Recruitment Rules, 1962, namely :—

1. These rules may be called the Import and Export Trade Control Organisation (Class I and Class II Posts) Recruitment (Amendment) Rules, 1964.

2. After rule 4 of the Import and Export Trade Control Organisation (Class I and Class II Posts) Recruitment Rules, 1962, the following rule shall be inserted, namely :—

“5. *Power to relax.*—Where the Central Government is of the opinion that it is necessary or expedient so to do, it may by order, for reasons to be recorded in writing and in consultation with the Union Public Service Commission, relax any of the provisions of these rules with respect to any class or category of persons.”

[No. 2-E.I(6)/58.]

K. K. SACHDEV, Under Secy.

ERRATA

The Date of the notification of Ministry of Commerce, No. G.S.R. 65, published in the Gazette of India Part II—Section 3(i), dated 9th January, 1965, on page 57, may be read as “28th December, 1964,” in place of “9th January, 1965.”

DEPARTMENT OF SOCIAL SECURITY

New Delhi, the 2nd January 1965

G.S.R. 106.—In exercise of the powers conferred by section 5 read with sub-section (1) of section 7 of the Employees' Provident Funds Act, 1952 (19 of 1952), the Central Government hereby makes the following Scheme further to amend the Employees' Provident Funds Scheme, 1952, namely :—

1. This Scheme may be called the Employees' Provident Funds (Second Amendment) Scheme, 1965.

2. In the Employees' Provident Funds Scheme, 1952, in clause (b) of subparagraph (3) of paragraph 1, sub-clause (xlv) shall be renumbered as sub-clause (xlvi) and before sub-clause (xlvi) as so renumbered, the following sub-clause shall be inserted, namely :—

“(xlv) as respects non-ferrous metals and alloys in the form of ingots industry specified in the notification of the Government of India in the Department of Social Security No. G.S.R. 1795 dated the 9th December, 1964, come into force on the 31st day of January, 1965;”

[No. 4/5/64/PF-II.]

New Delhi, the 6th January 1965

G.S.R. 107.—In exercise of the powers conferred by the first proviso to section 6 of the Employees' Provident Funds Act, 1952 (19 of 1952), the Central Government, after making necessary enquiry into the matter, hereby specifies every establishment of (i) tea plantations (other than the tea plantations in the State of Assam), (ii) rubber plantations, (iii) cardamom plantations (iv) pepper plantations and (v) lime-stone mines, in which fifty or more persons are employed, as an establishment to which the said proviso shall apply with effect from the 1st February, 1965.

[No. 15/3/63-PF.II(i).]

G.S.R. 108.—In exercise of the powers conferred by the first proviso to section 6 of the Employees' Provident Funds Act, 1952 (19 of 1952), the Central Government, after making necessary enquiry into the matter, hereby specifies every establishment which is a factory engaged in the manufacture of any of the items mentioned in the Schedule below, and in which fifty or more persons are employed, as an establishment to which the said proviso shall apply with effect from the 1st February, 1965.

SCHEDULE

1. Industrial and Power Alcohol industry.
2. Asbestos Cement Sheets industry.

[No. 15/(3)/63-PF.II(ii).]

S. A. AHMAD, Dy. Secy.

MINISTRY OF FOOD & AGRICULTURE

(Department of Food)

New Delhi, the 6th January 1965

G.S.R. 109.—In exercise of the powers conferred by clause 10 of the Sugar (Control) Order, 1963, the Central Government hereby makes the following further amendment to the Notification of the Government of India in the Ministry of Food and Agriculture (Department of Food) G.S.R. 891 dated the 28th May, 1963, namely:—

In the said notification, under item (a), after sub-item (vi) and the entry relating thereto, the following sub-item and entries shall be inserted, namely:—

“(vi a) The Controller of Foodgrains Distribution, Bombay. The Presidency Magistrates, Bombay.	}	Greater Bombay”.
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[No. F. 1(1)/63-S.Py.]

K. L. PASRICHA, Jt. Secy.

MINISTRY OF RAILWAYS

(Railway Board)

New Delhi, the 6th January 1965

G.S.R. 110.—In exercise of the powers conferred by the proviso to article 309 of the Constitution, the President hereby makes the following rules regulating the recruitment to the posts of Law Officer and Assistant Law Officer in the Indian Railways, namely:—

1. **Short title.**—These rules may be called the “Indian Railways Law Officer and Assistant Law Officer Recruitment Rules, 1965”.

2. Application.—These rules shall apply to the posts of Law Officer and Assistant Law Officer in the Indian Railways, specified in column 1 of the Schedule hereto annexed.

3. Number, classification and scale of pay.—The number of the said posts, their classification and the scale of pay attached thereto shall be as specified in columns 2 to 4 of the said schedule.

4. Method of recruitment, age limit, qualifications, etc.—The method of recruitment to the said posts, age limit, qualifications and other matters connected therewith shall be as specified in columns 5 to 13 of the said schedule:

Provided that the maximum age limit specified in column 6 of the said Schedule may be relaxed in the case of Scheduled Castes, Scheduled Tribes and other special categories of persons in accordance with the general orders issued by the Central Government from time to time.

5. Disqualifications.—(a) No person who has more than one wife living or who having a spouse living, marries in any case in which such marriage is void by reason of its taking place during the life time of such spouse, shall be eligible for appointment to the said posts; and

(b) no woman whose marriage is void by reason of the husband having a wife living at the time of such marriage or who has married a person who has a wife living at the time of such marriage, shall be eligible for appointment to the said posts:

Provided that the Central Government may, if satisfied that there are special grounds for so ordering, exempt any person from the operation of this rule.

THE SCHE-

Name of post	No. of posts	Classifi- cation	Scale of pay	Whether selection post or non- selection post	Age limit for direct recruits	Educational and other qualifications required for direct recruits
1	2	3	4	5	6	7
I. Law Officer.	1	Railway Service Class I.	Rs. 700 (6th year and under) 40—1100— 50/2—1250.	Selection	40 years and below (Relaxable for Govern- ment ser- vants).	<i>Essential :</i> (i) a degree in Law. (ii) About 10 years of practice as an Advocate preferably with experience of dealing with liti- gation connec- ted with comm- ercial claims (Qualifications relaxable at Commission's discretion in the case of candi- dates otherwise well qualifi- ed.)

DULE

Whether age and educational qualifications prescribed for the direct recruits will apply in the case of promotees	Period of probation, if any	Method of rectt. whether by direct rectt. or by promotion or transfer & percentage of the vacancies to be filled by various methods	In case of rectt. by promotion/transfer grades from which promotion to be made	If a DPC exists what is its composition	Circumstances in which U.P.S.C. is to be consulted in making rectt.
---	-----------------------------	---	--	---	---

8	9	10	11	12	13
Age—No. Educational qualifications—Yes.	2 Years	By transfer on deputation, failing which by promotion failing which by direct recruitment in consultation with the Union Public Service Commission.	<i>Transfer/Deputation</i> Suitable Officers holding analogous posts under State Central Government possessing a degree in Law and adequate experience of dealing with commercial claims etc. failing which suitable Class I (Senior Scale) officers of the Railways possessing a degree in Law and adequate experience of dealing with Commercial claims etc. failing which by a suitable Class I (Junior Scale) officer of the Railways due for promotion to Senior scale and possessing the same qualifications and experience.	Class I DPC	As required under the rules.

Promotion.

Assistant Law Officers and Class II officers of Railways belonging to Transportation (Traffic) and Commercial Department possessing a degree in Law and adequate experience of dealing with commercial claims etc. with at least five years service in the

1	2	3	4	5	6	7
2. Asstt. Law Officer.	8	Class I Junior Scale/ Class II.	Rs. 400—400— 450—30—600— 35—670—EB —35—950 (Jr. scale). Rs. 350—25— 500—30—590— EB—30—800 —EB—830— 35—900 (Class II).	Selection	35 years and below (Relaxable for Go- vernment Servants).	<p><i>Essential :</i></p> <p>(i) a degree in Law.</p> <p>(ii) About 5 years of practice as an Advocate, preferably with experience of dealing with litigation connected with commercial claims</p> <p>(Qualifications relaxable at the Commission's discretion in the case of candidates otherwise well qualified).</p>

8	9	10	11	12	13
Age—No. Educational qualifications— Yes.	2 years	By promotion failing which by transfer/ Deputation fail- ing which by direct recruit- ment in consul- tation with the Union Public Service Commis- sion.	<i>Promotion</i> Through selection (which will include <i>viva voce</i> test and also ordinarily a written test of Class III staff of the Railways who possess a Degree in Law and ade- quate experience of dealing with commercial claims and/or other legal matters. The se- lection will normally be made from the permanent staff working in the higher Class III scales as Law Su- pdt./Sr.Law Asstts./ Law Asstts., but if the field of se- lection is not ade- quate, those in the next one or two scales below, as the case may be may also be considered (ordi- narily with 5 years service in all the 3 scales, or 3 years in the higher scale). <i>Transfer/Deputation</i> Suitable officers holding analogous posts under State/ Central Govern- ment possessing a Degree in Law and adequate ex- perience of dealing with commercial claims etc. (Period of deputa- tion ordinarily not exceeding 3 years).	Classs I/ II D.P.C.	As required under the rules.

New Delhi, the 8th January 1965

G.S.R. 111.—In exercise of the powers conferred by section 47 of the Indian Railways Act, 1890 (9 of 1890), the Central Government hereby makes the following rules further to amend the Railways Red Tariff Rules, 1960, namely:—

1. These rules may be called the Railways Red Tariff (Amendment) Rules, 1965.

2. In the Railways Red Tariff Rules, 1960, in Table III at the end of Chapter III, under the heading "Class B (Liquids the vapours of which have flashing point at 24.4°C and higher temperature)", in the entries in column 1 under the sub-heading "Petroleum and other hydrocarbon oils", after the item "High speed diesel oil", the item "Iomex" shall be inserted.

[No. 64-TGII/21/7.]

New Delhi, the 9th January 1965

G.S.R. 112.—In exercise of the powers conferred by clause (a) of sub-section (1) and sub-section (3) of section 47 of Indian Railways Act, 1890 (9 of 1890) read with the notification of Government of India in the late department of Commerce and Industry No. 801 dated the 24th March, 1905, the Railway Board hereby sanction the application of the amendment published under the notification of the Government of India in the Ministry of Railways (Railway Board) No. G.S.R. 411 dated 23rd February, 1963, to rule 20 of general rules for all open lines of Railways in India administered by Government, to the following Railways, namely:—

- (1) Ahmadpur Katwa Railway.
- (2) Burdwan Katwa Railway.
- (3) Bankura Damodar River Railway.

[No. 62-TTV/29/32.]

P. C. MATHEW, Secy.

MINISTRY OF LABOUR & EMPLOYMENT

New Delhi, the 8th January 1965

G.S.R. 113.—The following draft of certain rules further to amend the Industrial Disputes (Central) Rules, 1957, which the Central Government proposes to make, in exercise of the powers conferred by section 38 of the Industrial Disputes Act, 1947 (14 of 1947), is published, as required by sub-section (1) of the said section, for the information of persons likely to be affected thereby; and notice is hereby given that any objections or suggestions received from any person with respect to the said draft on or before the 15th February, 1965 will be considered by the Central Government.

Draft Rules

1. These rules may be called the Industrial Disputes (Central) Amendment Rules, 1965.

2. After rule 8 of the Industrial Disputes (Central) Rules, 1957 (hereinafter called the said rules), the following rule shall be inserted, namely:—

"8A. *Notification regarding arbitration agreement by majority of each party.*—Where an industrial dispute has been referred to arbitration and the Central Government is satisfied that the persons making the reference represent the majority of each party, it shall publish a notification in this behalf in the Official Gazette for the information of the employers and workmen who are not parties to the arbitration agreement but are concerned in the dispute."

3. For rule 62 of the said rules, the following rule shall be substituted, namely:—

"62. *Application for recovery of dues.*—(1) Where any money is due from an employer to a workman or a group of workmen under a settle-

ment or an award or under the provisions of Chapter VA, the workman or the group of workmen, as the case may be, may apply in Form K-1 for the recovery of the money due:

Provided that in the case of a person authorised in writing by the workman, or in the case of the death of the workman the assignee or heir of the deceased workman, the application shall be made in Form K-2.

- (2) Where any workman or a group of workmen is entitled to receive from the employer any money or any benefit which is capable of being computed in terms of money, the workman or the group of workmen, as the case may be, may apply to the specified Labour Court in Form K-3 for the determination of the amount due or, as the case may be, the amount at which such benefit should be computed."

4. In the Schedule to the said rules—

- (a) in 'Form C', for the words "We further agree that the majority decision of the arbitrators shall be binding on us", the following shall be substituted, namely:—

"We further agree that the majority decision of the
in case the arbitrators are
arbitrators shall be binding on us.
equally divided in their opinion, they shall appoint another person as
umpire whose award shall be binding on us.

The arbitrator(s) shall make his (their) award within a period of _____ (here specify the period agreed upon by the parties) or within such further time as is extended by mutual agreement between us in writing. In case the award is not made within the period aforementioned, the reference to arbitration shall stand automatically cancelled and we shall be free to negotiate for fresh arbitration."

- (b) for "Forms K-1, K-2 and K-3" the following Forms shall be substituted, namely:—

"FORM K-1

[See Rule 62(1)]

Application under sub-section (1) of section 33C of the Industrial Disputes Act, 1947
To

- (1) The Secretary to the Government of India, Ministry of Labour and Employment, New Delhi.
- (2) The Regional Labour Commissioner (Central), _____ (here insert the name of the region).

Sir,

I/We have to state that I am/we are entitled to receive from _____
M/s. _____ a sum of Rs. _____ on account of _____
_____ under the provisions of Chapter VA of the
Industrial Disputes Act, 1947/in terms of the award dated the _____
given by _____/in terms of the settlement dated the _____
arrived at between the said M/s. _____ and their workmen through
_____ the duly elected representatives.

I/We further state that I/we served the management with a demand notice by registered post on _____ for the said amount which the management has neither paid nor offered to pay to me/us even though a fortnight has since elapsed. The details of the amount have been mentioned in the Statement hereto annexed.

I/We request that the said sum may kindly be recovered from the management under sub-section (1) of section 33C of the Industrial Disputes Act, 1947, and paid to me/us as early as possible.

	Signature of the applicant(s)	Address(es)
Station _____	1.	
	2.	
Date _____	3.	
	4.	

ANNEXURE

[here indicate the details of the amount(s) claimed].

FORM K-2

[See Rule 62(1)]

Application by a person authorised by a workman or by the assignee or heir of a deceased workman under sub-section (1) of section 33C of the Industrial Disputes Act, 1947.

To

- (1) The Secretary to the Government of India. Ministry of Labour & Employment, New Delhi.
- (2) The Regional Labour Commissioner (Central), _____ (here insert the name of the region).

Sir,

I *Shri/Shrimati/Kumari _____ have to state that *Shri/Shrimati/Kumari _____ *is/was entitled to receive from M/s. _____ a sum of Rs. _____ on account of _____ under the provisions of Chapter VA of the Industrial Disputes Act, 1947/in terms of the award dated the _____ given by _____/in terms of the settlement dated the _____ arrived at between the said M/s. _____ and their workmen through _____ the duly elected representatives.

I further state that I served the management with a demand notice by registered post on _____ for the said amount which the management has neither paid nor offered to pay to me even though a fortnight has since elapsed. The details of the amount have been mentioned in the Statement hereto annexed.

I request that the said sum may kindly be recovered from the management under sub-section (1) of section 33C of the Industrial Disputes Act, 1947, and paid to me as early as possible.

*I have been duly authorised in writing by _____ (here insert the name of the workman) to make this application and to receive the payment of the aforesaid amount due to him.

*I am the assignee/heir of the deceased workman and am entitled to receive the payment of the aforesaid amount due to him.

*Strike out the portions inapplicable.

Station _____	Signature of the applicant _____
Date _____	Address _____

ANNEXURE

(Here indicate the details of the amount claimed).

FORM K-3

[See Rule 62(2)]

Application under sub-section (2) of section 33C of the Industrial Disputes Act, 1947

Before the Central Government Labour Court at _____

Between

(1) Name of the applicant(s).

(2) Name of the employer.

The petitioner, _____, a workman of

The petitioners undersigned, workmen of

M/s. _____ of _____ is/are entitled to receive from the said M/s. _____ the money/benefits mentioned in the Statement hereto annexed.

It is prayed that the Court be pleased to determine the amount/amounts due to the petitioner(s).

Signature or thumb
impression(s) of
the applicant(s)

Address(es)

Station _____

1.

2.

Date _____

3.

4.

ANNEXURE

(Herein set out the details of the money due or the benefits accrued together with the case for their admissibility);

(c) in 'Form L' in the heading for the word "workman" the word "union" shall be substituted;

(d) in 'Form P' in the title of column (1) of the Table under paragraph 3, for the words "Category or designation", the words "Category and designation" shall be substituted.

[No. F. 2/1/64-L.R.-I.]

H. C. MANGHANI, Under Secy.

DEPARTMENT OF COMMUNICATIONS

(Posts and Telegraphs Board)

New Delhi, the 5th January 1965

G.S.R. 114.—In exercise of the powers conferred by the proviso to article 309 of the Constitution and in supersession of the Telegraph Traffic Service, Class I Recruitment Rules, 1958, the President hereby makes the following rules, namely:—

1. **Short title.**—These rules may be called the Telegraph Traffic Services, Class I Recruitment Rules, 1964.

2. **Application.**—These rules shall apply to the posts specified in column I of the Schedule annexed hereto.

3. **Number, classification, scale of pay etc.**—The number of the said posts, their classification, the scale of pay, method of recruitment and other matters connected therewith shall be as specified in columns 2 to 13 of the said Schedule.

4. **Disqualification.**—(a) No person who has more than one wife living or who having a spouse living, marries in any case in which such marriage is void by reason of its taking place during the life time of such spouse, shall be eligible for appointment to any of the said posts, and

(b) no woman whose marriage is void by reason of the husband having a wife living at the time of such marriage, shall be eligible for appointment to any of the said posts:

Provided that the Central Government may, if satisfied that there are special grounds for so ordering, exempt any person from the operation of this rule.

THE SCHEDULE

Name of Post	No. of posts	Classification	Scale of Pay	Whether Selection post or non-selection post	Age limit for direct recruits	Educational and other qualifications required for direct recruits.	Whether age and educational qualifications prescribed for the direct recruits will apply in the case of promotees.	Period of probation, if any	Method of rectt. whether by direct rectt. or by promotion or by deputation/transfer & percentage of the vacancies to be filled by various methods.	In case of rectt. by promotion deputation/transfer, grades from which promotion/deputation/transfer to be made.	If a DPC. exists, what is its composition in making rectt.	Circumstances in which U.P. S.C. is to be consulted in making rectt.
1	2	3	4	5	6	7	8	9	10	11	12	13
I Controller of Telegraph Traffic.	1	Telegraph Traffic Service Class I	Rs. 1300-60-1600	Selection	Not applicable	Not applicable	Not applicable	Not applicable	Promotion	Promotion In the case of pre-1931 entrants from amongst officers of Telegraph Traffic Service (Class I) (Rs. 1000-1500) and in the case of Post-1931 entrants from amongst officers of Grade I of the Telegraph Traffic Service (Class I) Rs. 1100-1400, provided at least 3 years approved service in the respective appointments is rendered.	Class I DPC	As required under the rules.

2. Chief Superintendent & Regional Controller of Telegraph Traffic (For pre-1931 entrants who had not opted for the prescribed scale).	(Including posts specified in items 3 and 4)	Telegraph Traffic Service Class I	Rs. 1000-50-1500	Selection	Not applicable.	Not applicable	Not applicable.	2 years	Promotion	Promotion of permanent officers of Grade I (Rs. 500-600) Grade II (Rs. 350-470) of Telegraph Traffic Service, Class II with 5 years service in the grades.	Class I DPC.	As required under the rules.
3. Chief Superintendent and Regional Controller of Telegraph Traffic Grade I (For Post-1931 entrants and pre-1931 entrants who had opted for the prescribed scale).	14 Including posts specified in items 2 and 4	T.T.S. Class I	Rs. 1100-50-1400	Non Selection	Not applicable.	Not applicable	Not applicable.	Not applicable	Promotion.	Promotion From amongst officers of Telegraph Traffic Service, Class II Grade II. (Rs. 700-1250)	Class I	As required under the rules.
4. Chief Superintendent and Regional Controller of Telegraph Traffic Grade II (For post-1931 entrants and pre-1931 entrants who had opted for the prescribed scale)	14 Including posts specified in items 2 and 3	T.T.S. Class I	Rs. 700-40-1100-50/2-1250	Selection	Not applicable.	Not applicable.	Not applicable.	2 years	Promotion.	Promotion From amongst permanent officers of Telegraph Traffic Service Class II (Rs. 350-900) with 5 years approved service in the grade.	Class I	As required under the rules.

[No. 52/1/61-STA.]
(Sd.) Illegible,
Asstt. Director Genl. (SG), P. & T. Directorate, New Delhi.

(P. & T] Board)

New Delhi, the 11th January 1965

G.S.R. 115.—In exercise of the powers conferred by section 10 of the Indian Post Office Act, 1898 (6 of 1898), the Central Government hereby makes the following rules further to amend the Indian Post Office Rules, 1933, namely —

1. (1) These rules may be called the Indian Post Office First (Amendment) Rules, 1965.
- (2) They shall come into force on the 1st of February 1965
- 2 In rule 6 of the Indian Post Office Rules, 1933, in the Schedule, for Lists I, II, III and IV, the following Lists shall be substituted, namely.—

List I

Aden, Cambodia, Eritrea, Ethiopia, French Coast of Somalia, Hongkong, Indonesia, Iran, Iraq, Kuwait, Laos, Macao, Malaysia, Persian Gulf (British Postal Agencies), Philippines, Saudi Arabia Somalia (Republic), Thailand, U.S.S.R. (in Asia), Vietnam and Yemen.

List II

Albania, Australia, Bechuanaland Protectorate, Belgium, Brunei, Bulgaria, Caroline (Islands), China, Cyprus, Czechoslovakia, Finland, France, Germany (Federal Republic), Germany (Democratic Republic), Gibraltar, Great Britain and Northern Ireland, Greece, Hungary, Iceland, Ireland, Israel, Italy, Japan, Jordan, Kenya, Korea, Lebanon, Libya, Liechtenstein, Madagascar, Malta, Monaco, Marian Islands, Marshall Islands, Mongolia, Morocco, North Borneo, Nyasaland, Portugal, Portuguese East Africa, Portuguese West Africa, Rumania, Saint Marin, Seychelles, South Africa (Republic), South West Africa, Southern Rhodesia, Sudan, Switzerland, Syria, Tanganyika and Zanzibar, Tunisia, Turkey, U A R (Egypt), Uganda, U S S R (in Europe), Vatican (City) and Zambia (Republic of)

List III

Algeria, Australia, Byelorussia, Denmark, Fanning Island, Ghana, Gilbert and Ellice Islands, Luxembourg, Mauritius, Nauru (Territory of), Norfolk (Island), Netherlands, Norway, Poland, Portuguese Timor, Reunion, Spain, Sweden, New Caledonia, Togolese Republic, Ukrain and Yugoslavia.

List IV

Argentina, Ascension, Bahamas Islands, Barbados, Bolivia, Brazil, British Guiana, British Honduras, Bermudas, Cameroons, Canada, Cayman Islands, Chile, Cape Verde Island, Colombia, Congo (Brazzaville), Congo (Leopoldville), Costa Rica, Cuba, Dahomey, Dominica, Dominican (Republic), Ecuador, El Salvador, Falkland Islands, Fiji, French Territories in Oceania, French Guiana, Guinea (Republic), Gambia, Gabon (Republic), Grenada, Guatemala, Haiti, Honduras (Republic), Hawaii, Ivory Coast, Jamaica, Leeward Islands, Liberia, Mali, Mauritania, Mexico, Netherland Antilles, New Guinea (Territory of), New Hebrides, New Zealand, Nicaragua, Niger, Nigeria, Panama (Canal Zone), Panama (Republic), Papua, Paraguay, Peru, Pitcairn (Island), Puerto Rico, Senegal, Samoa, Spanish Guinea, Salomon Islands, St Helena, St Lucia, Sierra Leone, Spanish West Africa, St Pierre and Miquelon, St Vincent, Surinam, Tchad (Republic), Tortola, Tonga, Trinidad and Tobago, Turks and Caicos Islands, United States of America, Uruguay, Upper Volta, Venezuela and Virgin Islands (U S A.)

[No 10-5/63-DA]

K. V RAJA, Asstt. Director-General (DA)

MINISTRY OF WORKS AND HOUSING

(Central Boilers Board)

New Delhi, the 29th December 1964

G.S.R. 116.—The following draft of certain Regulations further to amend the Indian Boiler Regulations, 1950, which the Central Boilers Board proposes to make in exercise of the powers conferred by section 28 of the Indian Boilers Act, 1923 (5 of 1923), is published as required by sub-section (1) of section 31 of the said Act, for the information of all persons likely to be affected thereby; and notice is hereby given that the said draft will be taken into consideration on or after the 31st March, 1965.

Any objections or suggestions which may be received from any person with respect to the said draft before the date so specified will be considered by the Central Boilers Board. Such objections or suggestions should be addressed to the Secretary, Central Boilers Board, Ministry of Works and Housing, North Block, New Delhi.

DRAFT REGULATIONS

1. These Regulations may be called the Indian Boiler (Amendment) Regulations, 1964.

* 2. In the Indian Boiler Regulations, 1950, for APPENDIX E, the following shall be substituted, namely:—

“APPENDIX E
FLANGES FOR PIPES, VALVES AND FITTINGS
TABLES

TABLE 1.—Temperature—Pressure Ratings for Carbon Steel Flanges

TABLE	TEMPERATURE													TABLE
	°F 0 to 450	500	550	600	650	700	750	800	825	850	875	900	Maximum hydraulic test pressure (lb/in ²) kg/cm ²	
	°C—17·8 to 232·2	260·0	287·8	315·6	343·3	371·1	399	427	441	454	468	482		
PRESSURE kg/cm ² (lb/in ²)														
D	7 (100)	6·65 (95)	5·95 (85)	5·6 (80)	4·9 (70)	4·55 (65)	3·85 (55)	3·5 (50)					10·5 (150)	D
E	14 (200)	12·95 (185)	11·9 (170)	10·85 (155)	9·8 (140)	9·1 (130)	8·05 (115)	7 (100)					21 (300)	E
F	21 (300)	19·6 (280)	17·85 (255)	16·45 (235)	15·05 (215)	13·65 (195)	11·9 (170)	10·5 (150)					31·5 (450)	F
H	35 (500)	32·55 (465)	30·1 (430)	27·65 (395)	24·85 (355)	22·4 (320)	19·95 (285)	17·5 (250)	15·05 (215)	12·6 (180)	10·5 (150)	8·05 (115)	52·5 (750)	H
J	49 (700)	45·5 (650)	42 (600)	38·5 (550)	35 (500)	31·5 (450)	28 (400)	24·5 (350)	21 (300)	17·85 (255)	14·7 (210)	11·2 (160)	73·5 (1050)	J
K	63 (900)	58·45 (835)	53·90 (770)	49·35 (705)	45·15 (645)	40·6 (580)	36·05 (515)	31·5 (450)	27·30 (390)	22·75 (325)	18·55 (265)	14·35 (205)	94·5 (1350)	K
R	84 (1200)	78·05 (1115)	72·1 (1030)	66·15 (945)	59·85 (855)	53·9 (770)	47·95 (685)	42 (600)	36·4 (520)	30·45 (435)	24·85 (355)	19·25 (275)	126 (1800)	R
S	126 (1800)	116·9 (1670)	108·15 (1545)	99·05 (1415)	89·95 (1285)	78·05 (1155)	72·1 (1030)	63 (900)	54·6 (780)	45·85 (655)	37·45 (535)	29·05 (415)	189 (2700)	S
T	196 (2800)	182 (2600)	168 (2400)	154 (2200)	140 (2000)	126 (1800)	112 (1600)	98 (1400)	84·7 (1210)	71·75 (1025)	58·45 (835)	45·15 (645)	294 (4200)	T

Intermediate values above 450°F (232·2°C) may be obtained by linear interpolation.

TABLE 2.—Temperature—Pressure Ratings for Alloy Steel Flanges

TABLE	TEMPERATURE																TABLE
	°F 0 to 450 °C —17·8 to 232·2	500	550	600	650	700	750	800	825	850	875	900	925	950	975	Maximum hyd- raulic test pres- sure/ (lb in ²) kg/ cm ²	
		260·0	287·8	315·6	343·3	371·1	399	427	441	454	468	482	496	510	524		
H J K R S T	PRESSURE kg/cm ² (lb/in ²)																H J K R S T
	35 (500)	32·90 (470)	31·15 (445)	29·05 (415)	27·3 (390)	25·2 (360)	23·45 (335)	21·35 (305)	20·3 (290)	19·6 (280)	18·55 (265)	17·5 (250)	13·65 (195)	9·8 (140)	5·6 (80)	52·5 (750)	
	49 (700)	46·2 (660)	43·4 (620)	40·95 (585)	38·15 (545)	35·35 (505)	32·55 (465)	30·1 (430)	28·7 (410)	27·3 (390)	25·9 (370)	24·5 (350)	18·9 (270)	13·3 (190)	7·7 (110)	73·5 (1050)	
	63 (900)	59·5 (850)	56 (800)	52·5 (750)	49 (700)	45·5 (650)	42 (600)	38·5 (550)	36·75 (525)	35 (500)	33·25 (475)	31·5 (450)	24·5 (350)	17·15 (245)	10·15 (145)	94·5 (1350)	
	84 (1200)	79·45 (1135)	74·55 (1065)	70 (1000)	65·45 (935)	60·55 (865)	56 (800)	51·45 (735)	49 (700)	46·55 (665)	44·45 (635)	42 (600)	32·55 (465)	23·1 (330)	13·65 (195)	126 (1800)	
	126 (1800)	119 (1700)	112 (1600)	105 (1500)	98 (1400)	91 (1300)	84 (1200)	77 (1100)	73·5 (1050)	70 (1000)	66·5 (950)	63 (900)	49 (700)	34·65 (495)	20·65 (295)	189 (2700)	
	196 (2800)	185·15 (2645)	174·65 (2490)	163·4 (2335)	152·6 (2180)	141·4 (2020)	130·55 (1865)	119·7 (1710)	114·45 (1635)	108·85 (1555)	103·6 (1480)	98 (1400)	75·95 (1085)	52·9 (770)	31·85 (455)	294 (4200)	

TABLE 3.—*Temperature—Pressure Ratings for Grey Cast Iron and Malleable Cast Iron Flanges*

TEMPERATURE					
°F 0 to 250	0 to 300	0 to 350	0 to 375	Up to 400	Maximum hydraulic test pressure (lb/in ²)
°C —17.8 to 121.1	—17.8 to 148.9	—17.8 to 176.7	—17.8 to 190.6	204.4	
TABLE					
PRESSURE kg/cm ² (lb/in ²)					
Boiler feed pipe installations, Steam etc.					
D	7(100)	5.25(75)	10.5(150)	3.5(50)	14(200)
E	14(200)			7(100)	28(400)
F	21(300)		14(200)	10.5(150)	42(600)
H	35(500)			70(1000)	

This rating does not apply to flange sizes above (24 in.) 610 mm.

These ratings do not apply to boiler feed pipe installation or other water pipes, valves and fittings subject to shock.

TABLE 4.—Temperature—Pressure Ratings for Copper Alloy Flanges

TABLE	TEMPERATURE							Maximum hydraulic test pressure (lb/in ²) kg/cm ²
	°F 0 to 250	300	350	400	450	500		
	°C—17.8 to 121.1	148.9	176.7	204.4	232.2	260.0		
	PRESSURE kg/cm ² (lb/in ²) applying to the size range							
	(1/2 in to 24 in) 13 mm to 610 mm (1/2 in to 8 in) 13mm to 203 mm							
D	7 (100)		6.65 (95)	6.3 (90)	5.6 (80)	4.55 (65)	3.5 (50)	10.5 (150)
E	12.25 (175)		11.55 (165)	10.85 (155)	9.45 (135)	8.4 (120)	7 (100)	18.55 (265)
F	17.5 (250)		16.8 (240)	15.4 (220)	13.65 (195)	12.25 (175)	10.5 (150)	26.25 (375)
H	28 (40)		26.6 (380)	24.5 (350)	22.4 (320)	19.95 (285)	17.5 (250)	42 (600)
J		38.5 (550)	36.75 (525)	33.95 (485)	30.8 (440)	27.3 (390)	24.5 (350)	57.75 (825)
K		42 (700)	46.9 (670)	43.05 (615)	38.85 (555)	35 (500)	31.5 (450)	73.5 (1050)

Intermediate values may be obtained by linear interpolation.

TABLE D.—Dimensions of Plain, Boss, Integrally Cast or Forged and Welding Neck Flanges

(For ratings see Tables 1, 3 and 4)

Thickness of flange

Flange size designation (nominal bore of pipe)	Diameter of flange	Bolt Circle diameter	No of bolts	Diameter of bolts*	Grey cast iron integrally cast or screwed on with boss	copper alloy cast or wrought integral or boss or plain	Wrought steel integral or plain or boss or welding neck (except for valves)	Cast steel integral or plain or boss or welding neck (except for valves)	Forged or cast steel integral (for valves only)
	D	P	N	O	T ₁	T ₂	T ₃	T ₄	T ₅
mm in	mm in	mm in		mm in	mm in	mm in	mm in	mm in	mm in
13 1/2	95 3-3/4	67 2-5/8	4	13 1/2	13 1/2	6 1/4	5 3/16	10 3/8	10 3/8
19 3/4	102 4	73 2-7/8	4	13 1/2	13 1/2	6 1/4	5 3/16	10 3/8	10 3/8
25 1	114 4-1/2	83 3-1/4	4	13 1/2	13 1/2	8 5/16	5 3/16	10 3/8	10 3/8
32 1-1/4	121 4-3/4	87 3-7/16	4	13 1/2	16 5/8	8 5/16	6 1/4	13 1/2	13 1/2
38 1-1/2	133 5-1/4	98 3-7/8	4	13 1/2	16 5/8	10 3/8	6 1/4	13 1/2	13 1/2
51 2	152 6	114 4-1/2	4	16 5/8	17 5 11/16	10 3/8	8 5/16	14 5 9/16	14 5 9/16
64 2-1/2	165 6-1/2	127 5	4	16 5/8	17 5 11/16	11 7/16	8 5/16	14 5 9/16	14 5 9/16
76 3	184 7-1/4	146 5-3/4	4	16 5/8	19 3/4	13 1/2	10 3/8	14 5 9/16	14 5 9/16
89 3-1/2	203 8	165 6-1/2	4	16 5/8	19 3/4	14 5 9/16	10 3/8	14 5 9/16	14 5 9/16
102 4	216 8-1/2	178 7	4	16 5/8	19 3/4	16 5/8	10 3/8	17 5 11/16	17 5 11/16
127 5	254 10	210 8-1/4	8	16 5/8	20 5 13/16	17 5 11/16	13 1/2	17 5 11/16	17 5 11/16
152 6	279 11	235 9-1/4	8	16 5/8	20 5 13/16	17 5 11/16	13 1/2	17 5 11/16	17 5 11/16
178 7	305 12	260 10-1/4	8	16 5/8	22 7/8	19 3/4	13 1/2	19 3/4	19 3/4
203 8	337 13-1/4	292 11-1/2	8	16 5/8	22 7/8	19 3/4	13 1/2	19 3/4	19 3/4
229 9	368 14-1/2	324 12-3/4	8	16 5/8	22 7/8	19 3/4	16 5/8	19 3/4	19 3/4
254 10	406 16	356 14	8	19 3/4	25 1	19 3/4	16 5/8	19 3/4	19 3/4
305 12	457 18	406 16	12	19 3/4	25 1	22 7/8	19 3/4	22 7/8	22 7/8
330 13	489 19-1/4	438 17-1/4	12	19 3/4	25 1	22 7/8	19 3/4	22 7/8	22 7/8
356 14	527 20-3/4	470 18-1/2	12	22 7/8	29 1-1/8	25 1	22 7/8	25 1	25 1
381 15	552 21-3/4	495 19-1/2	12	22 7/8	29 1-1/8	25 1	22 7/8	25 1	25 1
406 16	578 22-3/4	521 20-1/2	12	22 7/8	29 1-1/8	25 1	22 7/8	25 1	25 1

432	17	610	24	552	21-3/4	12	22	7/8	29	1-1/8	29	1-1/8	25	1	29	1-1/8	29	1-1/8
457	18	641	25-1/4	584	23	12	22	7/8	32	1-1/4	29	1-1/8	25	1	29	1-1/8	29	1-1/8
483	19	673	26-1/2	610	24	12	22	7/8	32	1-1/4	29	1-1/8	25	1	29	1-1/8	29	1-1/8
508	20	705	27-3/4	641	25-1/4	16	22	7/8	32	1-1/4	32	1-1/4	29	1-1/8	32	1-1/4	32	1-1/4
533	21	737	29	672	26-1/2	16	22	7/8	35	1-3/8	32	1-1/4	29	1-1/8	32	1-1/4	32	1-1/4
559	22	762	30	699	27-1/2	16	25	1	35	1-3/8	32	1-1/4	29	1-1/8	32	1-1/4	32	1-1/4
584	23	787	31	724	28-1/2	16	25	1	35	1-3/8	35	1-3/8	29	1-1/8	35	1-3/8	35	1-3/8
610	24	826	32-1/2	756	29-3/4	16	25	1	35	1-3/8	35	1-3/8	32	1-1/4	35	1-3/8	36	1-3/8

*(O) For 13mm (1/2 in) and 16mm (5/8 in) bolts, the diameters of the holes shall be 1.5mm (1/16 in) larger than the bolts and for 19mm (3/4 in) bolts and sizes above, the diameters shall be not more than 3mm (1/8 in) larger than the bolts. For cast iron flanges the diameters of the bolts holes may be 3mm (1/8 in) larger than the bolts of sizes 16mm (5/8 in) and above. For 22mm (7/8 in) bolts and sizes above, the diameters shall be not more than 3mm (1/8 in) larger than the bolts.

(T_s and T_e) It is impracticable to use thickness less than 13mm (1/2 in) except for boss flanges or integral flanges.

TABLE E.—Dimensions of Plain, Boss, Integrally Cast or Forged and Welding Neck Flanges

(For ratings see Tables 1, 3 and 4)

Thickness of flange

Flange size designation (nominal bore of pipe)		Diameter of flange		Bolt Circle diameter		No. of bolts		Diameter of bolts*		Grey cast iron integrally cast or screwed on with boss		Copper alloy cast or wrought integral or boss or plain		Wrought steel integral or plain or boss or welding neck (except for valves)		Cast steel integral or plain or boss or welding neck (except for valves)		Forged or cast steel integral (for valves only)	
		D		P		N		O		T ₁		T ₂		T ₃		T ₄		T ₅	
mm	in	mm	in	mm	in			mm	in	mm	in	mm	in	mm	in	mm	in	mm	in
13	1/2	95	3-3/4	67	2-5/8	4		13	1/2	13	1/2	6	1/4	6	1/4	10	3/8	10	3/8
19	3/4	102	4	73	2-7/8	4		13	1/2	13	1/2	6	1/4	6	1/4	10	3/8	10	3/8
25	1	114	4-1/2	83	3-1/4	4		13	1/2	13	1/2	8	5/16	7	9/32	10	3/8	10	3/8
32	1-1/4	121	4-3/4	87	3-7/16	4		13	1/2	16	5/8	8	5/16	8	5/16	13	1/2	13	1/2
38	1-1/2	133	5-1/4	98	3-7/8	4		13	1/2	16	5/8	10	3/8	9	11/32	13	1/2	13	1/2
51	2	152	6	114	4-1/2	4		16	5/8	19	3/4	10	3/8	10	3/8	14.5	9/16	14.5	9/16
64	2-1/2	165	6-1/2	127	5	4		16	5/8	19	3/4	11	7/16	10.5	13/32	14.5	9/16	14.5	9/16
76	3	184	7-1/4	146	5-3/4	4		16	5/8	19	3/4	13	1/2	11	7/16	14.5	9/16	14.5	9/16
89	3-1/2	203	8	165	6-1/2	8		16	5/8	19	3/4	14.5	9/16	12	15/32	14.5	9/16	14.5	9/16
102	4	216	8-1/2	178	7	8		16	5/8	22	7/8	16	5/8	13	1/2	17.5	11/16	17.5	11/16
127	5	254	10	210	8-1/4	8		16	5/8	22	7/8	17.5	11/16	17.5	9/16	17.5	11/16	17.5	11/16
152	6	279	11	235	9-1/4	8		19	3/4	22	7/8	17.5	11/16	17.5	11/16	17.5	11/16	17.5	11/16
178	7	305	12	260	10-1/4	8		19	3/4	25	1	19	3/4	19	3/4	19	3/4	19	3/4
203	8	337	13-1/4	292	11-1/2	8		19	3/4	25	1	19	3/4	19	3/4	19	3/4	19	3/4
229	9	368	14-1/2	324	12-3/4	12		19	3/4	25	1	20.5	13/16	20.5	13/16	20.5	13/16	20.5	13/16
254	10	406	16	356	14	12		19	3/4	25	1	22	7/8	22	7/8	22	7/8	22	7/8
305	12	457	18	406	16	12		22	7/8	29	1-1/8	25	1	25	1	25	1	25	1
330	13	489	19-1/4	438	17-1/4	12		22	7/8	29	1-1/8	25	1	25	1	25	1	25	1
356	14	527	20-3/4	470	18-1/2	12		22	7/8	32	1-1/4	25	1	29	1-1/8	29	1-1/8	25	1
381	15	552	21-3/4	495	19-1/2	12		22	7/8	32	1-1/4	25	1	32	1-1/4	32	1-1/4	25	1
406	16	578	22-3/4	521	20-1/2	12		22	7/8	32	1-1/4	25	1	32	1-1/4	32	1-1/4	25	1

432	17	610	24	552	21-3/4	12	22	7/8	25	1-3/8	29	1-1/8	35	1-3/8	35	1-3/8	29	1-1/8
457	18	641	25-1/4	584	23	16	22	7/8	35	1-3/8	29	1-1/8	35	1-3/8	35	1-3/8	29	1-1/8
483	19	673	26-1/2	610	24	16	22	7/8	35	1-3/8	32	1-1/4	38	1-1/2	38	1-1/2	32	1-1/4
503	20	705	27-3/4	641	25-1/4	16	22	7/8	38	1-1/2	32	1-1/4	38	1-1/2	38	1-1/2	32	1-1/4
533	21	737	29	672	26-1/2	16	25	1	38	1-1/2	35	1-3/8	41	1-5/8	41	1-5/8	35	1-3/8
559	22	762	30	699	27-1/2	16	25	1	38	1-1/2	35	1-3/8	44	1-3/4	44	1-3/4	35	1-3/8
584	23	787	31	724	28-1/2	16	25	1	41	1-5/8	35	1-3/8	44	1-3/4	44	1-3/4	35	1-3/8
610	24	826	32-1/2	756	29-3/4	16	29	1-1/8	41	1-5/8	38	1-1/2	47	1-7/8	47	1-7/8	38	1-1/2

*(O) For 13mm(1/2 in) and 16mm(5/8 in) bolts, the diameters of the holes shall be 1.5mm(1/16 in) larger than the bolts and for 19mm(3/4 in) bolts and sizes above, the diameters shall be not more than 3mm(1/8 in) larger than the bolts. For 22mm(7/8 in) bolts and sizes above, the diameters shall be not more than 3mm (1/8 in) larger than the bolts. For cast iron flanges the diameters of the bolt holes may be 3mm(1/8 in) larger than the bolts of sizes 16mm(5/8 in) and above.

(T₅ and T₆) It is impracticable to use thickness less than 13mm(1/2 in) except for boss flanges or integral flanges.

TABLE F.—Dimensions of Plain, Boss, Integrally Cast or Forged and Welding Neck Flanges

(For ratings see Tables 1, 3 and 4)

Thickness of flange

Flange size designation (nominal bore of pipe)		Diameter of flange		Bolt Circle diameter		No. of bolts	Diameter of bolts*		Grey cast iron integrally cast or screwed on with boss	Copper alloy cast or wrought integral or $\frac{1}{2}$ boss or plain	Cast or wrought steel integral or plain or boss or welding neck (except for valves)	Forged or cast steel integral (for valves only)		
		D		P		N	O		T ₁	T ₂	T ₃	T ₄		
mm	in	mm	in	mm	in		mm	in	mm	in	mm	in	mm	in
13	1/2	95	3-3/4	67	2-5/8	4	13	1/2	13	1/2	8	5/16	10	3/8
19	3/4	102	4	73	2-7/8	4	13	1/2	13	1/2	8	5/16	10	3/8
25	1	121	4-3/4	87	3-7/16	4	16	5/8	13	1/2	10	3/8	10	3/8
32	1-1/4	133	5-1/4	98	3-7/8	4	16	5/8	16	5/8	10	3/8	13	1/2
38	1-1/2	140	5-1/2	105	4-1/8	4	16	5/8	16	5/8	11	7/16	13	1/2
51	2	155	6-1/2	127	5	4	16	5/8	19	3/4	11	7/16	16	5/8
64	2-1/2	184	7-1/4	146	5-3/4	8	16	5/8	19	3/4	13	1/2	16	5/8
76	3	203	8	165	6-1/2	8	16	5/8	19	3/4	14.5	9/16	16	5/8
89	3-1/2	216	8-1/2	178	7	8	16	5/8	22	7/8	16	5/8	19	3/4
102	4	220	9	191	7-1/2	8	16	5/8	22	7/8	17.5	11/16	19	3/4
127	5	279	11	235	9-1/4	8	19	3/4	25	1	19	3/4	22	7/8
152	6	305	12	260	10-1/4	12	19	3/4	25	1	22	7/8	22	7/8
178	7	337	13-1/4	292	11-1/2	12	19	3/4	25	1	22	7/8	22	7/8
203	8	368	14-1/2	324	12-3/4	12	19	3/4	29	1-1/8	25	1	25	1
229	9	406	16	356	14	12	22	7/8	29	1-1/8	25	1	29	1-1/8
254	10	432	17	381	15	12	22	7/8	29	1-1/8	25	1	29	1-1/8
305	12	489	19-1/4	438	17-1/4	16	22	7/8	32	1-1/4	29	1-1/8	32	1-1/4
330	13	527	20-3/4	470	18-1/2	16	25	1	32	1-1/4	29	1-1/8	35	1-3/8
356	14	552	21-3/4	495	19-1/2	16	25	1	35	1-3/8	32	1-1/4	35	1-3/8
381	15	578	22-3/4	521	20-1/2	16	25	1	35	1-3/8	32	1-1/4	38	1-1/2
406	16	610	24	552	21-3/4	20	25	1	35	1-3/8	32	1-1/4	41	1-5/8

432	17	641	25-1/4	584	23	20	25	1	38	1-1/2	35	1-3/8	44	1-3/4	35	1-3/8
457	18	673	26-1/2	610	24	20	29	1-1/8	38	1-1/2	35	1-3/8	44	1-3/4	35	1-3/8
483	19	705	27-3/4	641	25-1/4	20	29	1-1/8	38	1-1/2	35	1-3/8	44	1-3/4	35	1-3/8
508	20	737	29	673	26-1/2	24	29	1-1/8	41	1-5/8	38	1-1/2	51	2	38	1-1/2
533	21	762	30	699	27-1/2	24	29	1-1/8	41	1-5/8	38	1-1/2	51	2	38	1-1/2
559	22	787	31	724	28-1/2	24	29	1-1/8	41	1-5/8	38	1-1/2	54	2-1/8	38	1-1/2
584	23	826	32-1/2	756	29-3/4	24	32	1-1/4	44	1-3/4	41	1-5/8	57	2-1/4	41	1-5/8
610	24	851	33-1/2	781	30-3/4	24	32	1-1/4	44	1-3/4	41	1-5/8	57	2-1/4	41	1-5/8

*(o) For 13 mm (1/2 in) and 16mm (5/8 in) bolts, the diameters of the holes shall be 1.5 mm (1/16 in) larger than the bolts and for 19 mm (3/4 in) bolts and sizes above, the diameters shall be not more than 3mm (1/8 in) larger than the bolts. For cast iron flanges the diameters of the bolt holes may be 3mm (1/8 in) larger than the bolts of sizes 16 mm (5/8 in) and above.

(T₁) It is impracticable to use thickness less than 13 mm (1/2 in) except for boss flanges or integral flanges.

TABLE H.—Dimensions of Plain, Boss, Integrally Cast or Forged and Welding Neck Flanges

(For ratings see Tables 1, 2, 3 and 4)

Thickness of flange

Flange size designation (nominal bore of pipe)	Diameter of flange	Bolt Circle Diameter	No. of bolts	Diameter of bolts*	Grey cast iron integrally cast or screwed on with boss	Copper alloy cast or wrought integral or boss or plain	Cast or wrought steel integral or plain or boss or welding neck (except for valves)	Forged or cast steel integral (for valves only)
	D	P	N	O	T ₁	T ₁	T ₂	T ₂
mm in	mm in	mm in		mm in	mm in	mm in	mm in	mm in
13 1/2	114 4-1/2	83 3-1/4	4	16 5/8	16 5/8	10 3/8	13 1/2	13 1/2
19 3/4	114 4-1/2	83 3-1/4	4	16 5/8	16 5/8	10 3/8	13 1/2	13 1/2
25 1	121 4-3/4	87 3-7/16	4	16 5/8	19 3/4	11 7/16	14.5 9/16	14.5 9/16
32 1-1/4	133 5-1/4	98 3-7/8	4	16 5/8	22 7/8	11 7/16	17.5 11/16	17.5 11/16
38 1-1/2	140 5-1/2	105 4-1/8	4	16 5/8	22 7/8	13 1/2	17.5 11/16	17.5 11/16
51 2	155 6-1/2	127 5	4	16 5/8	25 1	13 1/2	19 3/4	19 3/4
64 2-1/2	184 7-1/4	146 5-3/4	8	16 5/8	25 1	14.5 9/16	19 3/4	19 3/4
76 3	203 8	165 6-1/2	8	16 5/8	29 1-1/8	16 5/8	22 7/8	22 7/8
89 3-1/2	216 8-1/2	178 7	8	16 5/8	29 1-1/8	17.5 11/16	22 7/8	22 7/8
102 4	229 9	191 7-1/2	8	16 5/8	32 1-1/4	19 3/4	25 1	25 1
127 5	279 11	235 9-1/4	8	19 3/4	35 1-3/8	22 7/8	29 1-1/8	29 1-1/8
152 6	305 12	260 10-1/4	12	19 3/4	35 1-3/8	25 1	29 1-1/8	29 1-1/8
178 7	337 13-1/4	292 11-1/2	12	19 3/4	38 1-1/2	29 1-1/8	32 1-1/4	32 1-1/4
203 8	368 14-1/2	324 12-3/4	12	19 3/4	38 1-1/2	32 1-1/4	32 1-1/4	32 1-1/4
229 9	406 16	356 14	12	22 7/8	41 1-5/8	35 1-3/8	35 1-3/8	35 1-3/8
254 10	432 17	381 15	12	22 7/8	41 1-5/8	35 1-3/8	35 1-3/8	35 1-3/8
305 12	489 19-1/4	438 17-1/4	16	22 7/8	44 1-3/4	38 1-1/2	41 1-5/8	38 1-1/2
330 13	527 20-3/4	470 18-1/2	16	25 1	47 1-7/8	41 1-5/8	44 1-3/4	41 1-5/8
356 14	552 21-3/4	495 19-1/2	16	25 1	47 1-7/8	41 1-5/8	47 1-7/8	41 1-5/8
381 15	578 22-3/4	521 20-1/2	16	25 1	51 2	44 1-3/4	51 2	44 1-3/4
406 16	610 24	552 21-3/4	20	25 1	51 2	44 1-3/4	54 2-1/8	44 1-3/4
432 17	641 25-1/4	584 23	20	25 1	54 2-1/8	47 1-7/8	57 2-1/4	47 1-7/8
457 18	673 26-1/2	610 24	20	29 1-1/8	54 2-1/8	47 1-7/8	60 2-3/8	47 1-7/8

483	19	705	27-3/4	641	25-1/4	20	29	1-1/8	57	2-1/4	51	2	64	2-1/2	51	2
508	20	737	29	673	26-1/2	24	29	1-1/8	57	2-1/4	51	2	67	2-5/8	51	2
533	21	762	30	699	27-1/2	24	29	1-1/8	60	2-3/8	54	2-1/8	70	2-3/4	54	2-1/8
559	22	787	31	724	28-1/2	24	29	1-1/8	60	2-3/8	54	2-1/8	70	2-3/4	54	2-1/8
584	23	826	32-1/2	756	29-3/4	24	32	1-1/4	64	2-1/2	57	2-1/4	76	3	57	2-1/4
610	24	851	33-1/2	781	30-3/4	24	32	1-1/4	64	2-1/2	57	2-1/4	76	3	57	2-1/4

*(O) For 16 mm (5/8 in) bolts, the diameters of the holes shall be 1.5 mm (1/16 in) larger than the bolts and for 19 mm (3/4 in) bolts and sizes above, the diameters shall be not more than 3 mm (1/8 in) larger than the bolts. For cast iron flanges the diameters of the bolt holes may be 3 mm (1/8 in) larger than the bolts of sizes 16 mm (5/8 in) and above.

TABLE J.—Dimensions of Plain, Boss, Integrally Cast or Forged, and Welding Neck Flanges

(For ratings see Tables 1, 3 and 4)

(For ratings see Tables 1, 3 and 4)

Flange size] designation (nominal bore of pipe)	Approx. outside diameter of steel pipe		Diameter of flange	Bolt circle diameter	No. of bolts	Diameter of bolts*	Thickness of flange		
							Copper alloy cast or wrought integral or boss or plain	Cast or wrought steel integral or plain or welding neck (except for valves)	Forged or cast steel integral (for valves only)
	H		D	P	N	O	T _s	T _v	T _f
mm in	mm	in	mm in	mm in		mm in	mm in	mm in	mm in
13 1/2	21.4	27/32	114 4-1/2	83 3-1/4	4	16 5/8	16 5/8	16 5/8	16 5/8
19 3/4	27	1-1/16	114 4-1/2	83 3-1/4	4	16 5/8	16 5/8	16 5/8	16 5/8
25 1	34	1-11/32	121 4-3/4	87 3-7/16	4	16 5/8	19 3/4	19 3/4	19 3/4
32 1-1/4	43	1-11/16	133 5-1/4	98 3-7/8	4	16 5/8	19 3/4	19 3/4	19 3/4
38 1-1/2	48	1-29/32	140 5-1/2	105 4-1/8	4	16 5/8	22 7/8	22 7/8	22 7/8
51 2	60	2-3/8	165 6-1/2	127 5	4	19 3/4	25 1	25 1	25 1
64 2-1/2	76	3	184 7-1/4	146 5-3/4	8	19 3/4	25 1	25 1	25 1
76 3	89	3-1/2	203 8	165 6-1/2	8	19 3/4	32 1-1/4	32 1-1/4	32 1-1/4
89 3-1/2	102	4	216 8-1/2	178 7	8	19 3/4	32 1-1/4	32 1-1/4	32 1-1/4
102 4	114	4-1/2	229 9	191 7-1/2	8	19 3/4	35 1-3/8	35 1-3/8	35 1-3/8
127 5	140	5-1/2	279 11	235 9-1/4	8	22 7/8	38 1-1/2	38 1-1/2	38 1-1/2
	165	6-1/2							
152 6	168	6-5/8	305 12	260 10-1/4	12	22 7/8	38 1-1/2	38 1-1/2	38 1-1/2
178 7	194	7-5/8	337 13-1/4	292 11-1/2	12	22 7/8	41 1-5/8	41 1-5/8	41 1-5/8
203 8	219	8-5/8	368 14-1/2	324 12-3/4	12	22 7/8	41 1-5/8	41 1-5/8	41 1-5/8
229 9	244	9-5/8	406 16	356 14	12	25 1	.. ..	44 1-3/4	44 1-3/4
254 10	273	10-3/4	432 17	381 15	12	25 1	.. ..	47 1-7/8	47 1-7/8
305 12	324	12-3/4	489 19-1/4	438 17-1/4	16	25 1	.. ..	51 2	51 2
330 13	356	14	527 20-3/4	470 18-1/2	16	29 1-1/8	.. ..	54 2-1/8	51 2
356 14	381	15	552 21-3/4	495 19-1/2	16	29 1-1/8	.. ..	57 2-1/4	54 2-1/8
381 15	406	16	578 22-3/4	521 20-1/2	16	29 1-1/8	.. ..	60 2-3/8	54 2-1/8
406 16	..	..	610 24	552 21-3/4	20	29 1-1/8	.. ..	64 2-1/2	57 2-1/4

432 17	457 18	641 25-1/4	584 23	20	29 1-1/8	.. ..	67 2-5/8	60 2-3/8
457 18	.. ..	673 26-1/2	610 24	20	32 1-1/4	.. ..	70 2-3/4	60 2-3/8
483 19	508 20	705 27-3/4	641 25-1/2	20	32 1-1/4	.. ..	73 2-7/8	64 2-1/2
508 20	.. ..	737 29	673 26-1/2	24	32 1-1/4	.. ..	79 3-1/8	64 2-1/2
533 21	559 22	762 30	699 27-1/2	24	32 1-1/4	.. ..	83 3-1/4	67 2-5/8
559 22	.. ..	787 31	724 28-1/2	24	32 1-1/4	.. ..	86 3-3/8	67 2-5/8
584 23	610 24	826 32-1/2	756 29-3/4	24	35 1-3/8	.. ..	89 3-1/2	70 2-3/4
610 24	.. ..	851 33-1/2	781 30-3/4	24	35 1-3/8	.. ..	92 3-5/8	70 2-3/4

*(O) For 16 mm (5/8 in.) bolts, the diameters of the holes shall be 1.5 mm (1/16 in.) larger than the bolts and for 19mm (3/4 in.) bolts and sizes above, the diameters shall be not more than 3mm (1/8 in.) larger than the bolts.

(H) It is recommended that this size for steel pipes should be avoided wherever possible.

TABLE K.—Dimensions of Plain, Integrally Cast or Forged, and Welding Neck Flanges

(For ratings see Tables I, 3 and 4)

Thickness of flange										
Flange size designation (nominal bore of pipe)	Approx outside diameter of steel pipe		Diameter of flange		Bolt circle diameter	No. of bolts	Diameter of bolts*	Copper alloy cast or wrought integral or boss or plain	Cast or wrought steel integral or plain or welding neck (except for valves)	Forged or cast steel integral (for valves only)
	H		D		P	N	O	T _s	T _s	T _v
mm in	mm	in	mm	in	mm in		mm in	mm in	mm in	mm in
13 1 1/2	21.4	27 3/2	114	4-1 2	83 3-1 4	4	16 5/8	19 3/4	19 3/4	19 3/4
19 3 4	27	1-1/16	114	4-1 2	83 3-1/4	4	16 5/8	19 3/4	19 3/4	19 3/4
25 1	34	1-11/16	127	5	95 3-3 4	4	16 5/8	22 7/8	22 7/8	22 7/8
32 1-1 4	43	1-11/16	133	5-1 4	98 3-7 8	4	16 5/8	22 7/8	22 7/8	22 7/8
38 1-1/2	48	1-29/32	152	6	114 4-1 2	4	19 3/4	25 1	25 1	25 1
51 2	60	2-3 8	165	6-1 2	127 5	8	16 5/8	25 1	25 1	25 1
64 2-1/2	76	3	184	7-1 4	146 5-3/4	8	19 3/4	29 1-1/8	29 1-1/8	29 1-1/8
76 3	89	3-1 2	203	8	165 6-1/2	8	19 3 4	32 1-1 4	32 1-1/4	32 1-1/4
89 3-1/2	102	4	229	9	184 7-1 4	8	22 7/8	32 1-1 4	32 1-1/4	32 1-1/4
102 4	114	4-1/2	241	9-1 2	197 7-3 4	8	22 7/8	35 1-3 8	35 1-3/8	35 1-3/8
127 5	140	5-1/2	279	11	235 9-1 4	12	22 7/8	41 1-5 8	41 1-5/8	41 1-5/8
152 6	168	6-5 8	305	12	260 10-1 4	12	22 7/8	41 1-5 8	41 1-5/8	41 1-5/8
173 7	194	7-5/8	343	13-1/2	292 11-1/2	12	25 1	44 1-3 4	44 1-3/4	44 1-3/4
203 8	219	8-5/8	368	14-1/2	318 12-1/2	12	25 1	47 1-7/8	47 1-7/8	47 1-7/8
229 9	244	9-5 8	406	16	356 14	16	25 1	..	51 2	51 2
254 10	273	10-3/4	432	17	381 15	16	25 1	..	51 2	51 2
305 12	324	12-3/4	489	19-1 4	432 17	16	29 1-1 8	..	57 2-1/4	57 2-1/4
330 13	356	14	546	21-1/2	483 19	16	32 1-1/4	..	64 2-1 2	60 2-3/8
356 14	381	15	572	22-1 2	508 20	16	32 1-1/4	..	67 2-5/8	60 2-3/8
381 15	406	16	603	23-3 4	539 21-1/4	20	32 1-1/4	73 2-7/8	73 2-7/8	64 2-1/2
406 16			629	24-3 4	565 22-1/4	20	32 1-1/4	76 3	76 3	67 2-5/8
432 17	457 18		653	25-3/4	597 23-1/2	20	32 1-1/4	83 3-1/4	83 3-1/4	73 2-7/8
457 18	508 20		718	28-1/4	653 25-3 4	20	35 1-3 8	89 3-1/2	89 3-1/2	76 3
508 20	559 22		787	31	711 28	20	38 1-1 2	98 3-7/8	98 3-7/8	83 3-1/4
559 22	610 24		870	34-1 4	781 30-3 4	20	51 2	105 4-1/8	105 4-1/8	89 3-1/2

* (O) For 16mm (5/8 in.) bolts, the diameters of the holes shall be 1.5 mm (1/16 in.) larger than the bolts and for 19 mm (3/4 in.) bolts and sizes above, the diameters shall be not more than 3mm (1/8 in.) larger than the bolts

(H) It is recommended that this size for steel pipes should be avoided wherever possible,

TABLE R.—*Dimensions of Plain, Integrally Cast or Forged, and Welding Neck Flanges*
(For ratings see Tables 1 and 2)

Thickness of flange.

Flange size designation (nominal bore of pipe)		Approx. outside diameter of steel pipe		Diameter of flange		Bolt circle diameter.		No. of bolts	Diameter of bolts*		Cast or wrought steel integral or plain welding neck (except for valves)	Forged or cast steel integral (for valves only)	
H		D		P		N		O		T _s		T _f	
mm	in	mm	in	mm	in	mm	in		mm	in	mm	in	
13	1/2	21 1/4	2-7/32	114	4-1/2	83	3-1/4	4	16	5/8	19	3/4	
19	3/4	27	1-1/16	114	4-1/2	83	3-1/4	4	16	5/8	19	3/4	
25	1	34	1-11/32	127	5	95	3-3/4	4	16	5/8	22	7/8	
32	1-1/4	43	1-11/16	133	5-1/4	98	3-7/8	4	16	5/8	22	7/8	
38	1-1/2	48	1-29/32	152	6	114	4-1/2	4	19	3/4	25	1	
51	2	60	2-3/8	165	6-1/2	127	5	8	16	5/8	25	1	
64	2-1/2	76	3	184	7-1/4	146	5-3/4	8	19	3/4	29	1-1/8	
76	3	89	3-1/2	203	8	165	6-1/2	8	19	3/4	32	1-1/4	
89	3-1/2	102	4	229	9	184	7-1/4	8	22	7/8	32	1-1/4	
102	4	114	4-1/2	241	9-1/2	197	7-3/4	8	22	7/8	35	1-3/8	
127	5	140	5-1/2	279	11	235	9-1/4	12	22	7/8	41	1-5/8	
152	6	168	6-5/8	305	12	260	10-1/4	12	22	7/8	44	1-3/4	
178	7	194	7-5/8	343	13-1/2	292	11-1/2	12	25	1	47	1-7/8	
203	8	219	8-5/8	368	14-1/2	324	12-3/4	12	25	1	51	2	
229	9	244	9-5/8	406	16	356	14	16	25	1	54	2-1/8	
254	10	273	10-3/4	432	17	387	15-1/4	16	25	1	60	2-3/8	
305	12	324	12-3/4	508	20	457	18	16	29	1-1/8	70	2-3/4	
330	13	356	14	552	21-3/4	495	19-1/2	16	32	1-1/4	73	2-7/8	
356	14	381	15	584	23	527	20-3/4	16	32	1-1/4	79	3-1/8	
381	15	406	16	610	24	552	21-3/4	20	32	1-1/4	83	3-1/4	
406	16	..	..	641	25-1/4	584	23	20	32	1-1/4	89	3-1/2
432	17	457	18	673	26-1/2	610	24	20	32	1-1/4	92	3-5/8	
457	18	508	20	737	29	673	26-1/2	20	35	1-3/8	98	3-7/8	
508	20	559	22	806	31-3/4	730	28-3/4	20	38	1-1/2	105	4-1/8	
559	22	610	24	895	35-1/4	806	31-3/4	20	51	2	114	4-1/2	
												95	3-3/4

* (O) For 16mm (5/8 in.) bolts, the diameters of the holes shall be 1.5 mm (1/16 in.) larger than the bolts and for 19 mm (3/4 in.) bolts and sizes above, the diameters shall be not more than 3 mm (1/8 in.) larger than the bolts.

(H) It is recommended that this size for steel pipes should be avoided wherever possible.

TABLE S. *Dimensions of plain, integrally cast or forged, and welding neck flanges*

(For ratings see Tables 1 and 2)

(For ratings see Tables 1 and 2)													Thickness of flange	
Flange size designation (nominal bore of pipe)		Approximate outside diameter of steel pipe		Diameter of flange		Bolt circle diameter		No. of bolts	Diameter of bolts*		Cast or wrought steel integral or plain or welding neck (except for valves)	Forged or cast steel integral (for valves only)		
H		D		P		N		O		T ₁		T ₂		
mm	in	mm	in	mm	in	mm	in		mm	in	mm	in		
13	1/2	21.4	27/32	127	5	89	3-1/2	4	19	3/4	22	7/8		
19	3/4	27	1-1/16	127	5	89	3-1/2	4	19	3/4	22	7/8		
25	1	34	1-11/32	140	5-1/2	102	4	4	19	3/4	25	1		
32	1-1/4	43	1-11/16	146	5-3/4	108	4-1/4	4	19	3/4	29	1-1/8		
38	1-1/2	48	1-29/32	159	6-1/4	121	4-3/4	4	19	3/4	29	1-1/8		
51	2	60	2-3/8	171	6-3/4	133	5-1/4	8	19	3/4	32	1-1/4		
64	2-1/2	76	3	184	7-1/4	146	5-3/4	8	19	3/4	32	1-1/4		
76	3	89	3-1/2	203	8	165	6-1/2	8	22	7/8	35	1-3/8		
89	3-1/2	102	4	235	9-1/4	191	7-1/2	8	22	7/8	38	1-1/2		
102	4	127	5	248	9-3/4	203	8	8	25	1	41	1-5/8		
114	4-1/2	140	5-1/2	267	10-1/2	216	8-1/2	8	25	1	41	1-5/8		
127	5	152	6	286	11-1/4	235	9-1/4	12	22	7/8	44	1-3/4		
152	6	168	6-5/8	324	12-3/4	273	10-3/4	12	25	1	51	2		
		178	7											
178	7	194	7-5/8	315	14-3/4	318	12-1/2	12	29	1-1/8	57	2-1/4		
		219	8-5/8											
203	8	244	9-5/8	413	16-1/4	356	14	12	32	1-1/4	64	2-1/2		
229	9	273	10-3/4	438	17-1/4	387	15-1/4	16	29	1-1/8	73	2-5/8		
254	10	298	11-3/4	483	19	425	16-3/4	16	32	1-1/4	79	2-7/8		
279	11	324	12-3/4	533	21	470	18-1/2	16	35	1-3/8	86	3-1/8		
305	12	356	14	578	22-3/4	508	20	16	38	1-1/2	92	3-5/8		
330	13	381	15	610	24	540	21-1/4	16	38	1-1/2	98	3-7/8		
356	14	406	16	648	25-1/2	578	22-3/4	20	38	1-1/2	105	4-1/8		
381	15	..	..	699	27-1/2	632	24-1/2	20	41	1-5/8	111	4-3/8
406	16	457	18	743	29-1/4	711	26	20	44	1-3/4	117	4-5/8		

*(O) The diameters of the bolt holes shall be not more than 1.5 mm (1/8 in.) larger than the bolts.

(H) It is recommended that these sizes for steel pipes should be avoided wherever possible.

TABLE T. Dimensions of plain, integrally cast or forged, and welding neck flanges
(For ratings see Tables 1 and 2)

Thickness of flange

Flange size designation (nominal bore of pipe)	Approximate outside diameter of steel pipe	Diameter of flange	Bolt circle diameter	No. of bolts	Diameter of bolts*	Cast or wrought steel integral or plain or welding neck (except for valves)	Forged or cast steel integral (for valves only)
	H	D	P	N	O	T _s	T _v
mm in	mm in	mm in	mm in		mm in	mm in	mm in
13 1/2	21.4 27/32	140 5-1/2	102 4	4	19 3/4	25 1	25 1
19 3/4	27 1-1/16	140 5-1/2	102 4	4	19 3/4	25 1	25 1
25 1	34 1-11/32	146 5-3/4	108 4-1/4	4	19 3/4	29 1-1/8	29 1-1/8
32 1-1/4	43 1-11/16	159 6-1/4	121 4-3/4	4	22 7/8	32 1-1/4	32 1-1/4
38 1-1/2	60 2-3/8	171 6-3/4	133 5-1/4	8	19 3/4	35 1-3/8	35 1-3/8
51 2	76 3	184 7-1/4	146 5-3/4	8	19 3/4	35 1-3/8	35 1-3/8
64 2-1/2	89 3-1/2	203 8	165 6-1/2	8	22 7/8	41 1-5/8	41 1-5/8
76 3	102 4	235 9-1/4	191 7-1/2	8	25 1	48 1-7/8	48 1-7/8
89 3-1/2	114 4-1/2	267 10-1/2	216 8-1/2	8	29 1-1/8	54 2-1/8	54 2-1/8
102 4	127 5	286 11-1/4	235 9-1/4	8	29 1-1/8	57 2-1/4	57 2-1/4
114 4-1/2	140 5-1/2	298 11-3/4	254 10	12	25 1	60 2-3/8	60 2-3/8
127 5	168 6-5/8	324 12-3/4	273 10-3/4	12	29 1-1/8	67 2-5/8	67 2-5/8
152 6	194 7-5/8	375 14-3/4	318 12-1/2	12	32 1-1/4	73 2-7/8	73 2-7/8
178 7	219 8-5/8	432 17	368 14-1/2	12	35 1-3/8	83 3-1/4	83 3-1/4
203 8	244 9-5/8	476 18-3/4	406 16	12	38 1-1/2	89 3-1/2	89 3-1/2
	273 10-3/4						
229 9	298 11-3/4	508 20	445 17-1/2	16	35 1-3/8	95 3-3/4	95 3-3/4
254 10	324 12-3/4	559 22	489 19-1/4	16	38 1-1/2	108 4-1/4	108 4-1/4
279 11	356 14	616 24-1/4	533 21	16	44 1-3/4	114 4-1/2	114 4-1/2
305 12	381 15	653 25-3/4	572 22-1/2	16	44 1-3/4	120 4-3/4	120 4-3/4
330 13	406 16	705 27-3/4	610 24	16	51 2	130 5-1/8	130 5-1/8

* (O) The diameters of the bolt holes shall be not more than 3mm (1/8 in) larger than the bolts.

(H) It is recommended that these sizes for steel pipes should be avoided wherever possible.

The suitability of a flange not complying with the tables of flange dimensions and the temperature and pressure rating given in this Appendix shall be determined by calculations made in accordance with the formulae and procedure given below. The maximum stress in bolts or in the flange shall not exceed those permissible for materials used.

Permissible Stresses for Materials—

Bronze and Cast iron—For Bronze and Cast iron the permissible stress shall not exceed the minimum specified tensile strength for the grade of material used divided by a factor of safety of five.

Steel for Bolts, Wrought, Cast and Forged steel—For plain carbon and alloyed steels, the permissible stress for bolts and flanges at temperatures below 454°C (850°F) shall be the 0.2 per cent proof stress divided by a factor of safety of 1.5 for bolts and 1.1 for flanges. For temperatures above 454°C (850°F), the permissible stress for the materials for bolts and flanges shall be furnished by the makers or suppliers in the calculations.

Symbols used in the formulae given are as follows:

(all dimensions are given in millimeters, working pressure in Kg/cm², stresses in Kg/mm², loads in Kgs. and temperatures in °C)

- T . Thickness of flange
- D . outside diameter of flange
- D_b . Diameter of pitch circle of bolts
- D_i . Inside diameter of gasket
- D_p . Outside diameter of gasket
- D_m . Mean diameter of gasket
- W.P. . Working pressure
- d_b . diameter of bolts over threads
- d_{off} . diameter of bolt at bottom of threads or shank diameter whichever is less
- d_h . diameter of bolt-hole
- d . bore of flange
- n . number of bolts in flange
- f . permissible stress for material at service temperature
- a₁ . gasket constant (1) as follows:

(i) 2400 for soft gaskets of thickness of the order of 1.5 mm.

(ii) 3600 for metal gaskets of copper or soft steel

(iii) 7200 for flat and solid gaskets of steel or monel

a₂—gasket constant (2) as follows :

32 for (i) above

40 for (ii) above

52 for (iii) above

C—temperature factor as given below:

Temp.	125	150	175	200	225	250	275	300	325	350	375	400	425	450
°C	0.91	0.90	0.89	0.88	0.87	0.86	0.84	0.83	0.82	0.80	0.78	0.75	0.72	0.68

Intermediate values may be interpolated
For flanges to figures E/1, E/2 & E/3,

$$\sqrt{D_m = \frac{D_p + d}{2}} \quad \sqrt{\quad}$$

For flanges to figures E/4 & E/5,

$$\sqrt{D_m = \frac{D_h + d - d_h}{2}} \quad \sqrt{\quad}$$

(Figures overleaf)

m—bolt load factor, being greater of the two values

$$\sqrt{\left(\frac{Ca}{Q \times WP}\right)} \quad \text{and} \quad \left(1 + \frac{a^2}{q}\right) \sqrt{\quad}$$

The value of 'm' shall not be less than 2 and need not be greater than 4 for group (i) of gaskets under a₁ or greater than 5 for other groups. For temperatures above 450° the value of 'm'

$$\text{shall be } \left(1 + \frac{a^2}{q} \right)$$

$$q = \frac{D_m}{b_{\text{eff}}}$$

b = width of gasket

b_{eff} = effective width of gasket for narrow faced gaskets (see table below)

Width of corrugated or serrated gasket	10	20	30	40	50	60
b _{eff} for tongue and groove joint	2.3	5	7	8	8.5	8.8
b _{eff} for other forms of joint	4.4	8	9.8	11.2	12.6	13.6

$$W_b = \frac{m \times \pi \times D_m^2}{400} \times WP$$

$$W.P. = \frac{f \times n \times 100 \times d_{\text{eff}}^2}{m \times D_m^2}$$

$$W_p = \text{Load on gasket} \left(\frac{\pi \times D_m \times b \times m \times WP}{100} \right)$$

$$W_b = \text{Total load on bolts} \left(\frac{\pi \times D_m^2 \times m \times WP}{100} \right)$$

$$W_b^I = \text{Bolt load due to internal pressure only} \left(\frac{\pi \times D_m^2 \times WP}{100} \right)$$

$$W_a = \text{Axial load due to internal pressure} \left(\frac{\pi \times d^2}{400} \times WP \right)$$

$$W = \text{Load on annular surface of flange inside gasket} \frac{\pi [(D_m - b)^2 - d^2]}{400} \times W.P.$$

$$Q_I = \text{Radial force acting on the circumference of } D_m$$

$$\text{For equilibrium } W_b = W_p + W_a + W_i$$

$$= WP \times \sum A$$

$$= WP \times \left[\frac{\pi D_m \times b \times m}{100} + \frac{\pi d^2}{400} + \frac{\pi (D_m - b)^2 - d^2}{400} \right]$$

$$M = \text{moment of forces } W_b, W_p, W_a \text{ and } W_i$$

$$= WP \times A_I \text{ (for moment arms See fig. E/6 overleaf)}$$

(For W_b the line of action is to be taken through the central line of bolt holes; for W_a through the central line of pipe wall or hub at its maximum thickness; for W_p through Central

line of gasket having a width of 15 mm or less or else through a line $b/3$ away from the outer edge of gasket and for W_1 through a line midway between inner line of gasket and bore of pipe. For a flat packing surface and gasket over the whole area,

$$M = 0.5 \times W_a \left(\frac{D_h - d - t}{2} \right)$$

(See figs. E/6, E/7 & E/14).

H = height of hub over inner face of flange

t = thickness of pipe wall or parallel hub

t_h = maximum thickness of tapered hub (fig. E/8)

t_m = mean thickness of tapered hub

$$= \frac{t + 2t_h}{3} \text{ (fig. E/11)}$$

$t_{\text{eff}} = t_h + \frac{r}{6}$ where 'r' is the fillet radius between hub and flanges.

K = a factor for giving a measure of length of hub or shell over which the moment remains effective

$$= \frac{1.82}{\sqrt{t_m(d + t_m)}} \text{ or } \frac{1.82}{\sqrt{t(d + t)}} \text{ whichever is applicable}$$

M_I = effective moment per unit length

$$= \frac{M}{\pi(d + t_m)} \times E$$

$$\text{Where } E = \frac{g}{g^2 + (g-1)^2 + h}$$

$$g = 1 + \frac{KT}{2}$$

$$h = \frac{0.64 \times \left(\frac{T}{t_m}\right)^3}{K(d + t_m)} \times \log_e \left(\frac{D}{d}\right)$$

$$f_1 = \text{stress due to bending} = \frac{6 M_I}{2 t_{\text{eff}}}$$

$$f_2 = \text{stress due to axial load} = \frac{d \times W.P.}{400 t_{\text{eff}}}$$

$$(f_1 + f_2) = \text{maximum stress in flange}$$

For values of KH equal to or greater than 1.7

$$f = \frac{6 M_I}{t_{\text{eff}}^2} + \frac{d \times WP}{400 \times t_{\text{eff}}}$$

$$\text{or } WP = \frac{f}{\left[\frac{6}{t_{\text{eff}}^2} \times \frac{M_I}{\pi(d + t_m)} \times E + \frac{d}{400 \times t_{\text{eff}}} \right]}$$

For values of KH less than 1.7, M_1 shall be substituted by the following:

$$M_3 = \left(1 - \frac{KH}{1.7}\right)^2 \times (M_3 - M_2)$$

Where M_3 is calculated in the same manner as M_1 with long hub of uniform thickness and M_2 without hub i.e. directly attached to pipe wall.

WORKED OUT EXAMPLES

Examples on the calculation of bolts and Flange sizes from Tables 'H' & 'I' Appendix 'E' for different pressures and temperatures.

Example 1.

Flange according to Fig. E/12/1 (Table H)—Fig. over leaf.

12 bolts, 19mm dia ($d_{eff} = 15.80$)

Temperature & Pressure rating—(a) 17.5 kg/cm^2 at 427°C

(b) 32.7 Kg/cm^2 at 260°C

Calculations for bolts.

Case (a) Bolt material Carbon—Molybdenum steel or

Carbon=Manganese Steel ($50 \text{ kg/mm}^2 \text{ min}^m$)

Proof stress at 427°C minimum— 15 Kg/mm^2

Permissible stress at $427^\circ\text{C} = \frac{15}{1.5} = 10 \text{ Kg/mm}^2 \text{ min}^m$

$D_m = 181$; $b_{eff} = 9.5$

Bolt load factor $m = \frac{Ca_1}{q \times WP}$ or $1 + \frac{a_2}{q}$

$$= \frac{0.72 \times 3600 \times 9.5}{181 \times 17.5} \text{ or } 1 + \frac{40 \times 9.5}{181}$$

$= 7.8$ or 3.1 (taken at 4)

$$WP = \frac{10 \times 12 \times 100 \times 15.80 \times 15.80}{4 \times 181 \times 181} = 22.8 \text{ Kg/cm}^2$$

Case (b) Bolt material Carbon=Manganese ($50 \text{ Kg/mm}^2 \text{ min}^m$)

Proof stress at 260°C (minimum)— 20 Kg/mm^2

Permissible stress at $260^\circ\text{C} = \frac{20}{1.5} = 13.35 \text{ Kg/cm}^2$

$$\text{Bolt load factor } m = \frac{0.85 \times 2400 \times 9.5}{181 \times 32.7} \text{ or } 1 + \frac{32 \times 9.5}{181}$$

$$= 3.27 \text{ or } 2.7 \text{ (taken at } 3.27)$$

$$WP = \frac{13.35 \times 12 \times 100 \times 15.80 \times 15.80}{3.27 \times 181 \times 181} = 37.35 \text{ Kg/cm}^2$$

Calculations for flange

Case (a) $K = \frac{1.82}{\sqrt{t_m (d + t_m)}}$ Where $t_m = \frac{10 + 2 \times 16}{3} = 14$

$$= \frac{1.82}{\sqrt{14 (152 + 14)}} = 0.038$$

$$KH = 0.038 \times 57 = 2.166 > 1.7$$

$$g = 1 + \frac{0.038 \times 28}{2} = 1.53$$

$$h = \frac{0.64 \times \left(\frac{28}{152}\right)^3}{0.038 \left(\frac{152}{152} + 24\right)} \times \text{Log}_e \left(\frac{305}{152}\right) = 0.56$$

$$E = \frac{1.53}{(1.53)^2 + (0.53)^2 + 0.56} = 0.482$$

$$A_a = \frac{\pi \times (152)^2}{400}; \quad I_a = \frac{(210 - 19.2) - (152 + 16)}{2} = 11.4$$

$$A_b = \frac{\pi \times \left(\frac{210 + 152}{2}\right)^2}{400} \times 4; \quad I_b = \frac{261 - (210 - 19.2)}{2} = 35.1$$

(Since moments are taken about the line of action of W_p at a distance of 9.6 mm from the outer edge of the gasket)

$$\Sigma A_I = \frac{\pi}{400} [(152)^2 \times 12.4 + (181)^2 \times 4 \times 35.1]$$

$$= 38100$$

$$t_{\text{eff}} = t_h + \frac{r}{3} = 19.3$$

$$f_a = W.P \times \left[\frac{6}{2} \times \frac{\Sigma A_I}{\pi(d + t_m)} \times E + \frac{d}{400 \times t_{\text{eff}}} \right]$$

$$= 17.5 \times \left[\frac{6}{(19.3)^2} \times \frac{38100}{\pi \times 166} \times 0.48 + \frac{152}{400 \times 19.3} \right]$$

$$= 17.5 \times (0.568 + 0.0197)$$

$$= 17.5 \times 0.59$$

$$= 10.3 \text{ Kg/mm}^2$$

The material should therefore have a proof stress of (10.3×1.1) or 11.3 Kg/mm^2 at 427°C i.e. the material may have the same physical characteristics as the bolt material.

Calculations for flange

Case (b) $n = 3.2$

$$E = 0.48$$

$$t_{\text{eff}} = 19.3$$

$$A_b = \frac{\pi \times (181)^2 \times 3.2}{400}; \quad \Sigma A_b = 30900$$

$$f_b = 32.7 \times \left[\frac{6}{(19.3)^2} \times \frac{30900}{\pi \times 166} \times 0.48 + \frac{152}{400 \times 19.3} \right]$$

$$= 32.7 \times (0.457 + 0.0197)$$

$$= 32.7 \times 0.477$$

$$= 15.60 \text{ Kg/mm}^2$$

The material should therefore have a proof stress of (15.60×1.1) or 17.15 Kg/mm^2 at 260°C . This is within the limits for Carbon—Manganese steel with a minimum tensile strength of 55 Kg/mm^2 .

Example 2 Flange according to Fig. E/13/1 (Table T)—Fig. overleaf

12 bolts, 38 mm dia ($d_{\text{eff}} = 32.7 \text{ mm}$)

Temperature and pressure ratings (a) 32 Kg/cm^2 at 524°C

(b) 98.5 Kg/cm^2 at 482°C

(c) 131 Kg/cm^2 at 399°C

Calculations for bolts

Case (a) Bolt material—Special Chrome—Molybdenum steel

(95 Kg/mm² minimum)

Permissible stress—to be specified by makers along with creep relaxation properties.

$$\text{Bolt load factor } m = 1 + \frac{a_1}{q} = 1 + \frac{52 \times 12.5}{250} = 3.6$$

$$f_a = \frac{32 \times 3.6 \times 250 \times 250}{12 \times 100 \times 32.7 \times 32.7}$$

$$= 5.60 \text{ Kg/mm}^2$$

Case (b) $m = 3.6$

$$f_b = \frac{98.5 \times 3.6 \times 250 \times 250}{12 \times 100 \times 32.7 \times 32.7} = 17.3 \text{ Kg/mm}^2$$

with $m = 3$, $f_b = 14.4 \text{ Kg/mm}^2$

$$\text{Case (c) } m = \left(\frac{0.75 \times 7200 \times 12.5}{250 \times 131} \right) \text{ or } \left(1 + \frac{52 \times 12.5}{250} \right)$$

$$= 3.6 \text{ or } 2.06 \text{ (taken as 3 which may be regarded as optimum)}$$

$$f_c = \frac{131 \times 3 \times 250 \times 250}{12 \times 100 \times 32.7 \times 32.7}$$

$$= 19.2 \text{ Kg/mm}^2$$

Calculations for flange

$$\text{Case (a) } t_m = \frac{36.5 + 2 \times 51}{3} = 46.16$$

$$K = \frac{1.82}{\sqrt{46.16(203 + 46.16)}} = 0.017$$

$$KH = 0.017 \times 115 = 1.955 > 1.7$$

$$g = 1 + \frac{0.017 \times 89}{2} = 1.757$$

$$h = \frac{0.64 \times \left(\frac{89}{46.16} \right)^3}{0.017 \times 249.16} \times \log_e \left(\frac{476}{203} \right) = 0.932$$

$$E = \frac{1.757}{(1.757)^2 + (0.757)^2 + 0.932} = 0.38$$

$$A_a = \frac{\pi \times (203)^3}{400}; \quad I_a = \frac{(298 - 32) - (203 + 51)}{2} = 6$$

$$A_b = \frac{\pi \times (205)^3}{400} \times 3.6; \quad I_b = \frac{(407 - 267)}{2} = 70$$

$$t_{eff} = t_h + \frac{r}{3} = 54$$

$$\Sigma A_a = \frac{\pi}{400} \left[(203)^3 \times 6 + (250)^3 \times 3.6 \times 70 \right]$$

$$= \pi [616 + 39400] = \pi \times 40018$$

$$f_a = \left(32 \times \frac{6}{(54)^3} \times \frac{\pi \times 40018}{\pi \times 249.16} \times 0.38 + \frac{203}{400 \times 54} \right)$$

$$= 32 \times (0.126 + 0.0094)$$

$$= 4.31 \text{ Kg/mm}^2$$

Example 2

Case (b)

$$m=3.6 \text{ \& } 3$$

$$E=0.38$$

$$t_{eff}=54$$

$$\text{For } m=3.6, \quad f_b = 98.5 \times \left[\frac{6}{(54)^3} \times \frac{\pi \times 40018 \times 0.38}{\pi \times 249.16} + \frac{203}{400 \times 54} \right]$$

$$= 9.79 \text{ Kg/mm}^2$$

$$\text{For } m=3, \quad f_a = 98.5 \left[\frac{6}{(54)^3} \times \frac{\pi \times 33400}{\pi \times 249.16} + \frac{203}{400 \times 54} \right]$$

$$= 11.18 \text{ Kg/mm}^2$$

Case (c)

$$m=3.6 \text{ \& } 3$$

$$E=0.38$$

$$t_{eff}=54$$

$$\text{For } m=3.6, \quad f_c = 131 \times \left[\frac{6}{(54)^3} \times \frac{\pi \times 40018 \times 0.38}{\pi \times 249.16} + \frac{203}{400 \times 54} \right]$$

$$= 131 \times 0.1354$$

$$= 17.7 \text{ Kg/mm}^2$$

$$\text{For } m=3, \quad f_c = 131 \times 0.1136$$

$$= 14.8 \text{ Kg/mm}^2.$$

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